CHEMICAL MARKETS

RUPERT C. WATSON
Managing Editor

WILLIAMS HAYNES, Publisher

ELMER F. SHEETS
Assistant Editor

VOLUME XXIII | ESTABLISHED 1914 | NUMBER 6

Contents for December, 1928

Consulting Editors:

ROBERT T. BALDWIN
BENJAMIN T. BROOKS
CHARLES R. DOWNS
WILLIAM M. GROSVENOR
ARTHUR D. LITTLE
CHARLES H. MACDOWELL
JOHN E. TEEPLE
T. B. WAGNER
MILTON C. WHITAKER
FRANK C. WHITMORE

Handling and Packaging

Further to serve the plan executive readers of CHEMICAL MARKETS we are instituting with this issue another department of prime importance to this type of reader. This new department will be known as Handling and Packaging and will be devoted to a discussion of new, unique or interesting development in the field of chemical containers and handling equipment.

As with our Plant Management Department, it is proposed to build this section to a point where it will be of really constructive value to the executive with his many knotty container and handling problems.

CHEMICAL MARKETS, INC., Publishers

Publication Office, 28 Renne Ave., Pittsfield, Mass. Editorial and General Office, 25 Spruce St. New York City

WILLIAMS HAYNES, PRESIDENT; ROBERT STRANGE, SECRETARY; D. O. HAYNES, JR., TREASURER

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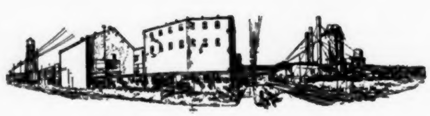

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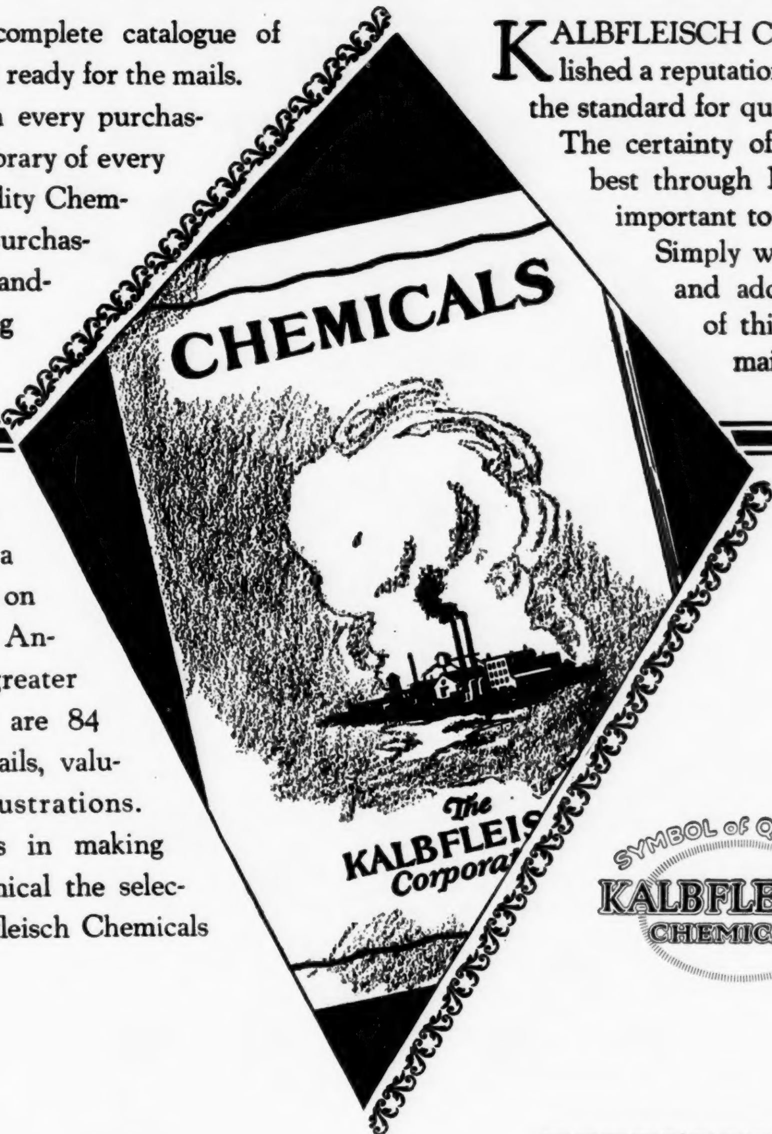

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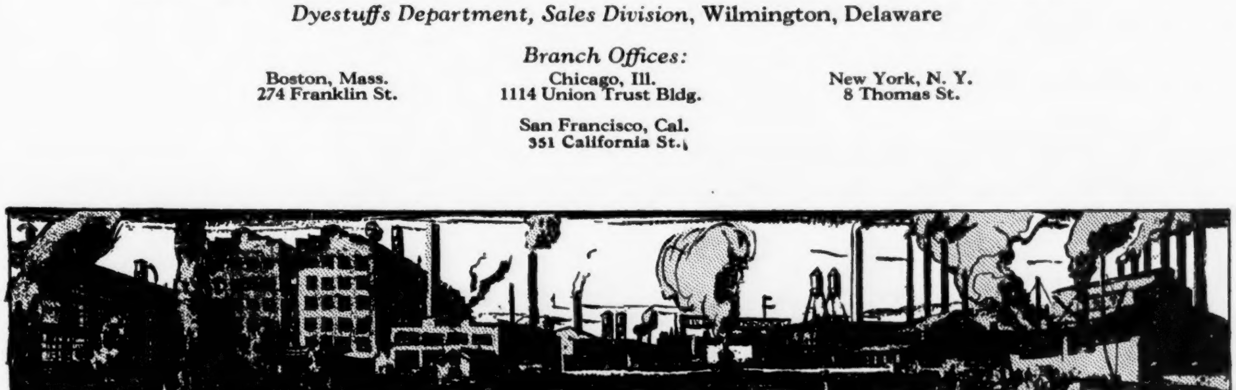

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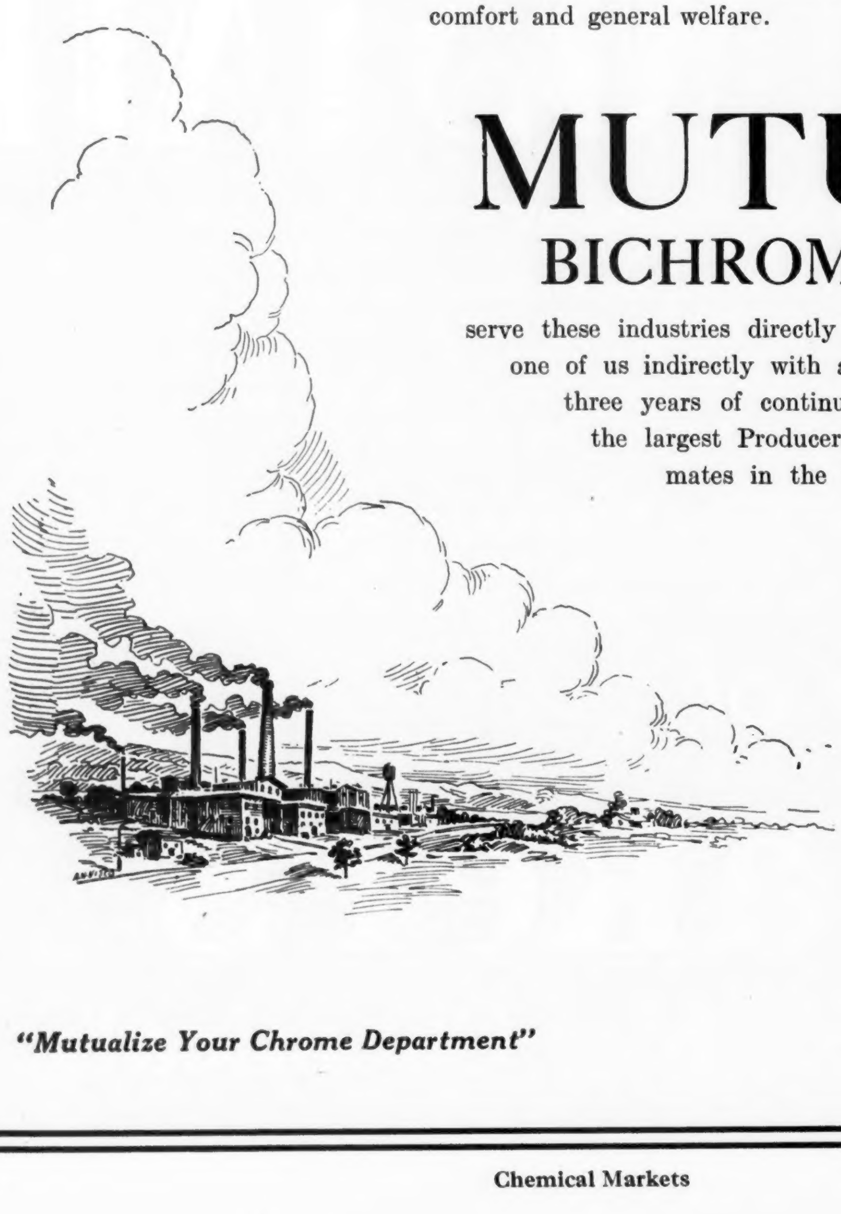

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CHEMICAL MARKETS

Vol. XXIII. December, 1928 No. 6.

Chemical Financing

A corporation has recently been organized under the laws of Delaware to deal in chemical company securities — not, so its officers explain, as an investment trust; but to furnish small chemical enterprises with capital and management counsel by acquiring a substantial common stock interest and a dominating place on the directorate. Profits would presumably accrue to the financing group through the enhanced value of their stock holdings as the result of their cash investment and superior management.

This is a perfectly legitimate proposal. It is precisely the general type of financial co-operation in chemical manufacturing which we have recognized as a sore need of the industry and a splendid opportunity for sound and experienced financiers. We look forward to the time when powerful organizations, similar to those which finance and manage public utility companies, will render similar service in chemical fields, and when our larger banks will have chemical divisions, with expert technical and economic staffs, in their industrial departments.

For all that we know this new chemical financing organization is able and willing to render such services. But unfortunately we do not know this certainly; and before entering into any such intimate relations as such a proposal entails, both the chemical executive and the investor have every reason to exercise extreme caution in the choice of their financial ally.

Success or failure in a chemical enterprise today is most directly under the control of two factors, the soundness of the research and the adequacy of the capital that are behind the business. For this reason we have, on numerous occasions, advocated protective and offensive alliances between chemistry and finance.

Large scale operations in chemicals require heavy investments and financial interests that were at once patient and chemically intelligent would be an inestimable benefit. On the other hand, our bankers and investors have been quick to recognize the dividend destroying features of chemical re-search, but slower to appreciate fully the implications of a chemical era in industry and the opportunities that will open to capital which is thoroughly informed and alert to the new values created by this same research. Obviously, a better understanding between chemical and financial interests will be a very considerable mutual advantage; but as we have often taken pains to point out, there are certain dangers lurking in the specific terms and of such alliances.

Our Foreign Visitors

During the past couple of years we have kept open house for an army of chemical visitors from overseas. They have flooded in, industrialists and technicians, salesmen and scientists, big men and small fry, Jew and Gentile from every nation, shifty spies and honest students; good, bad, and indifferent; and we have made them all more than welcome. We have dined them on our homely, hearty American fare and wined them with synthetic cocktails. We have put them up at our clubs and taken them out to our golf courses. We have placed them at the head of the program at our association meetings. Our universities have given them honorary degrees and our societies have elected them honorary members. We have shown them our plants and explained to them our sales methods. We have frankly discussed business and finance with them and introduced them freely to our customers and our bankers. In a word we have been keen to give to each and every one whatever it was — entertainment, honors, information — that his heart most desired.

We detest a begrudging welcome; yet for the very reason that we are jealous of our open-handed, open-hearted hospitality should we not begin to appraise these foreign visitors of ours a little more critically ? If we lavish the uttermost of cordiality upon the cad, the sneak, the imposter, what proper greeting have we left for the gentleman and the scholar ?

Is there, for example, any good reason why we should sit very humbly at the feet of Herr Docktor while he expounds theories of coal combustion which the very practice of our plants have already anti-dated by five years ? Should Baron Whosit be invited to lunch after making a business proposal so nefarious that it would have brought any American promoter a curt invitation to get out of our sight ? By what logic do we hail an executive from dole-ridden, strike-torn England as a messiah of labor problems, or a *savant* from individualistic, artistic France as a prophet of mass production ? Why do we pay a French chemist a big, round sum for a chemical process that never had worked and how comes it that a German chemist earns a fat fee for research aimed to make workable a process for which he had already been paid a bigger, rounder sum ? Does a strange accent, a different cut of clothes, a foreign address bestow omnipotence in every field of economics and chemistry ? Or is it not just possible that our good judgment is tainted still with the myth of imported superiority ?

Unless we discriminate more nicely we not only insult the honest business man and the sound chemist from abroad, but we also help to fix that European opinion which regards Americans — in the vigorous language of Frank Simmons — as being "either suckers or sinners".

Chemical Tariff Schedule

In dollars and cents three quarters of our chemical imports, come into the country duty free; and these imports have grown from $87,971,000 pre-war, to $100,549,000 in 1922 when the present tariff went into effect, to $138,319,268 last year.

These figures smear up rather badly the popular picture of our chemical industry nestling snugly behind a protecting tariff wall. That wall, insofar as chemicals are concerned, has obviously many a gaping breach. Yet because of the close-woven interdependencies of raw material, product, and by-product existing in chemical commerce, any proposal to adjust the chemical schedule by chopping down a buttress here and filling a gap there is fraught with dangerous difficulties. For this reason a through-going tariff revision, such as the Republicans promised, is infinitely to be preferred by the chemical industry to tariff tampering which the recently converted protectionist Democrats had proposed. The result of the election makes such a revision obligatory upon the party now safely in control of Congress.

During the coming tariff revision, agricultural chemicals will take the place of crucial importance held in the past by coal-tar chemicals. The duty on ammonium sulfate is almost certain to be removed and now that there is an effective production of urea for fertilizer use the 35 per cent. duty on this material will probably be lowered. Schedules on the new synthetic ammoniates, not on the market in 1922, will plainly come under discussion, and other new products, and chemicals which have assumed a new industrial importance, will be storm centers.

At the present time the Tariff Commission is actively studying the rates on the various sodium phosfates, tartaric acid and cream of tartar, glue and edible gelatine, decolorizing carbons, and whiting, these schedules having already been questioned. Already the industry is alert and busy collecting facts and figures, for although it is promised that present rates will be changed only upon proof

of the need for revision, nevertheless some of the most logical changes will affect wide circles of competitors and consumers.

Cloaking Our Ignorance

We have reasons aplenty to be a bit uppish when we consider all the advance that has been made in chemical knowledge during the past two centuries. It is therefore, a wholesome check to our conceit to be pulled up short once in a while by a realization that there are still many chemical phenomena commonly used in this industry about which we are wholly ignorant. Here is a sample:

> "Bring two gases together, nothing happens, because, you see, the molecules are not friendly. But introduce a catalyzing agent. Under its benign influence the molecules accept each other's embraces and you may get an entirely new product or an old one very cheaply.

This is the very language of the alchemist who personified chemical substances with attributes of love and hate and who explained chemical reactions in terms of affinities and jealousies, births and deaths. But these are not the words of the learned Dr. Faustus. They were delivered before the recent Coal Conference by Dr. Carl Krauch, director of the I. G. and one of the wisest and shrewdest of our industrial chemists.

Nor is the fault with the poverty of our language. This neoromantic style which prattles about "benign influences" and "friendly molecules" is simply an admission that we know no more about the whys and wherefores of catalyts than we do about the real reason why hydrogen and oxygen combine to make H_2O.

The Outlook for 1929

Business in the chemical industry during the year which is now rapidly drawing to a close has lived up to the predictions which were made for it at this time last year. Using the present contract season's returns as a criterion of what may be expected for 1929, indicates that the coming year will be equally as good as has 1928 from the point of view of sales volume.

While there are some exceptions to the existing good conditions, these are more than counterbalanced by the firm position of many of the large volume tonnage chemicals. Alcohol, which at this time last year, presented a rather dubious outlook, has taken a turn for the better, and while we hesitate to subscribe to the theory that the present position of alcohol is very well maintained there seems no question that the disheartening price slashing of 1927 has been modified to a great extent. Alkali chemicals, particularly caustic soda, looked on as the barometer of the industry, are another example of the sound condition of the market to-day. Solvent materials, methanol, acetate of lime and acetic acid are other items which come to mind as continuing to maintain the strength gained as the year draws to a close.

Among other things, the tremendous volume of sale of heavy chemicals and solvent materials to the fast growing lacquer and rayon industries, has been responsible for the strong position of many of the items. A glance at some estimated figures of the consumption of chemicals in the rayon industry during 1928, reveal the true significance of the potentialties for the future of these particular chemicals. The consumption of caustic soda in the viscose process field will be 164,000,000 pounds and sulfuric acid 123,000,000 pounds. This may be the answer to the admitted strength of both these chemicals. The viscose process field will also account for the consumption of carbon disulfide to the extent of 49,200,000 pounds. In addition it has been estimated that this consumption will be increased during 1929 to 200,000,000, 150,000,000 and 60,000,000 pounds of caustic soda, sulfuric acid and carbon disulfide respectively.

Continuing along the list we find such imposing figures as 248,000,000 pounds of mixed acid, 480,000 gallons of alcohol, 8,000,000 gallons of ether, 32,000,000 pounds of calcium monosulfide, 16,000,000 pounds of ammonium sulfate, 1,200,000 pounds of copper and 4,500,000 pounds of ammonia.

While we have no estimates as to lacquer solvent consumption, the strength of the markets would indicate that sales of equal magnitude are responsible for the strength in the chemical raw materials. Thus it would seem that these and other industries which have been recently coming to the fore will more than make up for the volume of sales lost to the chemical industry by the curtailing of industries which these new ventures have partially supplanted. Next year should go a long way toward regulating buying conditions in these industries and until this is the case it will not be possible to gauge the full benefit to the chemical industry.

They Say:---

Of the seven commodities and lines replacing the old, it is said that today five of these, i. e., the automobile, motion pictures, *chemical*, radio and electrical industries furnish a living to over 30,000,000 people. This has come about through research, the most potent arm of greater efficiency.—*E. W. McCullough, U. S. Chamber of Commerce.*

Combined improvement in the earnings of chemical companies was disclosed by the statements recently published by eight companies. A good advance was registered in the first half of the year when a larger group of eleven companies had a 13% rise in profits over the same half-year of 1927.—*National Bank of Commerce Monthly.*

We must constantly guard our essential chemical industries with adequate protection tariffs. It is of little advantage that we may buy imported goods for a little less, if the money leaves the country and American workers are thrown out of their jobs.—*American Trade Mark Association.*

Individualism has its limitations and isolation its handicaps. Business and industry are today too complex for a single human mind to comprehend all about it — that is the problem which confronts management today.—*E. W. McCullough, U. S. Chamber of Commerce.*

Because I talk of business does not mean that I place material things above spiritual things. On the contrary, I see prosperity merely as the rich soil from which spiritual virtues as well as education and art and satisfactions in life can grow.—*Herbert Hoover.*

Present business, immediate trade prospects, inventories, employment conditions, the demand for labor, the wage scale paid and the degree of industrial peace enjoyed by industry, all show an improvement over 1927.—*National Association of Manufacturers.*

In American business life of today there seem to be three gods:—Mass Production, Co-operation and Combination, and under their guidance we are apparently embarked on the greatest era of prosperity the world has ever known.—*The Test Tube.*

My Government will omit no sacrifices by means of which Chile can supply humanity, in the best possible condition, with the vital elements which she has at her disposal and which are indispensable to them.—*The President of the Chilean Republic.*

Profits are no longer the difference between selling price and cost. Instead, they are the difference between new ideas and old ones, new and out-of-date methods, new and obsolete equipment.—*Ray M. Hudson, Bureau of Standards.*

Nitrates can be produced more economically by other processes than the cyanamid process, and by the use of coal at less cost than by the use of hydro-electric power.—*National Fertilizer Association.*

The pacifist oratory at the Assembly of the League of Nations is Christmas card platitude at best and humbug at worst.—*G. Bernard Shaw.*

Ten Years Ago

From "Drug and Chemical Markets" December 1918

Du Pont Chemical Co. is granted a charter under the laws of Delaware with an authorized capital of $3,600,000; the E. I. du Pont de Nemours also files a charter at Dover, Del., with an authorized capital of $100,000.

Leading manufacturers present plan to War Industries Board regarding licensing of dyestuff importers as a method of protecting American industry from destruction through foreign competition.

Manufacture of acetone by distillation of corn becomes one of the most important of the new chemical industries established in Canada as a result of the war; production exceeds ten tons a day.

Dr. William Beckers, vice-president, National Aniline & Chemical Co. is granted leave of absence for a year. He intends to retire and devote his time to several institutions in which he is interested.

British Dyes, Ltd., and Levinstein, Ltd., to be amalgamated in a new corporation to be called the British Dyestuff Corp. Final consummation awaits shareholders' agreement.

Census is to be taken of coal-tar chemicals on account of the rapid development of the industry in the United States and the complex and technical tariff problems involved.

Charles F. Kelly appointed sales manager of Monsanto Chemical Works. His attention is to be directed to the marketing of Monsanto pharmaceutical products.

Butterworth-Judson Corporation, Newark, N. J., reduces its operations and decreases its force of employees owing to cancellation of Government contracts.

Grasselli Chemical Co. purchases chemical division of Bayer Co. for $2,500,000; Sterling Products Co. also announces purchase of Bayer Co. stock.

American Dyes Institute and American Dyestuffs Manufacturers' Association is to hold a joint meeting with a view to amalgamating.

United States Industrial Chemical Co.'s contract to supply acetone is cancelled by Government for purpose of taking an invenotry.

E. I. du Pont de Nemours & Co. asks Federal Trade Commission for five additional licenses covering German patents.

War-Time Chemical Progress and Peace-Time Chemical Products

By Alan A. Claflin

The L. B. Fortner Company, Boston

Concluding his survey on chemical expansion during and since the World War, Mr. Claflin tells of the development of many commodities which were considered the result of drastic war measures, but which to-day form a major group of the chemical industry.

To the student of chemical progress during the war period, acetone is a most interesting product. While the War brought an unprecedented demand for many chemical products, this demand could be met by the extensive and expansion of peace time facilities for their production, but in the case of acetone this was not true.

Up to 1914 there was one primary source for the production of acetone, namely, the dry distillation of wood. In this distillation, acetone is obtained from two sources, first the rectification of the crude wood spirit, and second, the dry distillation of acetate of lime. On an anhydrous basis, the crude wood spirit may yield as much as fifteen per cent. acetone, although this yield is higher than ever realized if the acetone is to conform to the standards of purity required by the British authorities for the manufacture of Cordite. In the distillation of acetate of lime, the reaction is $(CH_3\,COO)_2\,Ca = (CH_3)_2\,CO + Ca\,Co_3$ and twenty-six pounds of acetone for one hundred pounds of acetate is an exceptionally good yield. In fact, the average plant yield was generally nearer nineteen or twenty pounds of pure acetone, but the so-called acetone oils, which are the higher and mixed — ketones, made acetone production moderately profitable. Since in the average wood distilling plant the yield of a cord of wood is only a little over two hundred pounds of acetate of lime and five or six gallons of crude spirit on a dry basis, it will be seen that from a cord of wood rather less than fifty pounds of acetone can be expected. A wood distilling plant with reasonably efficient by-product and recovery equipment cost just prior to the war from \$2,500 to \$3,500 per cord. To increase the acetone production therefore by the construction of wood distilling plants was almost a hopeless proposition, particularly since to obtain even the meagre yields of commercial practice, it is necessary to distill seasoned wood, or if kiln drying was resorted to, this would mean much additional plant and fuel. Then the man power involved would make expansion in this direction practically impossible in war time. If acetone were to be made from calcium acetate, then other sources for that material must be developed rather than wood distillation. Two were available and immediate attention given them.

The first of these was the oxidation of ethyl alcohol virtually an adaptation of the ordinary and familar quick vinegar process to the production of a technical product rather than a comestible. In the Indies, both East and West and in India itself, Great Britain had vast resources of molasses that could be fermented to alcohol, and the alcohol thus obtained, diluted to rather less than five per cent. and run over bamboo shavings inoculated with acetic bacteria, is oxidized fairly quantitatively to acetic acid. The greatest loss in this process is due to the alcoholic fermentation rather than the acetic oxidation and a yield of around four pounds of acetic acid to a gallon of molasses is obtained.

In United States one large "quick vinegar" plant was constructed by the Government to operate on alcohol made at the U. S. Industrial Alcohol plant at Curtis Bay, near Baltimore. After the war this plant was taken over by the alcohol company, and it is interesting to note that due to their development of a process of esterification in the vapor phase, they are able to use the dilute acetic acid made in this vinegar plant for making the acetate esters now so largely used as solvents.

Since Great Britain had great electric power reserves in Canada, notably at Niagara and Shawinigan Falls, the production of calcium carbide was rapidly increased. As is well known, calcium carbide evolves acetylene when added to water, according to the reaction $Ca\,C + 2H_2O = Ca(O\,H)_2 + C_2H_2$. This acetylene is absorbed in sulfuric acid in the presence of mercuric sulfate and from this sulfuric acid solution on warming aldehyde is distilled. Aldehyde is readily oxidized with a platinum or cerium oxide catalyst to acetic acid. As this oxidation takes place in the vapor phase, pure and practically anhydrous acetic acid is

directly obtained. As a process of making glacial acetic acid it is probable that this oxidation of aldehyde obtained from acetylene will shortly supercede the purification and concentration of acetic acid obtained from the distillation of wood.

Meanwhile in England, there was being developed a process for acetone that was independent of the destructive distillation of acetate. This process is the fermentation of farinaceous mashes by special bacilli. For a long time it had been known that in the ordinary alcoholic fermentation certain higher alcohols are formed, these alcohols being collectively known as fusel oil. Fusel oil was sold directly as a solvent or separated into its constituent alcohols, mainly amyl, which in turn were converted into esters for solvent purposes. Now it was always a debatable question among distillery bacteriologists whether the fusel oils are formed by the action of yeasts on some constituents of the mash, if in the rather complex metabolism by which sugar is converted into ethyl alcohol these higher alcohols are formed, or whether these higher alcohols are produced by the action of special bacteria that contaminated commercial yeasts. The fact that the yield of fusel oil is fairly constant and independent of the source of the mash, indicated the second or third explanation more probable, although the composition of a fusel oil from a grain mash differs considerably from a molasses mash.

Synthesis of Rubber

During the latter part of the Nineteenth Century, distillery chemists were giving some attention to the subject as the increasing demand particularly for amyl acetate as a nitro cellulose solvent made fusel oil a particularly profitable by-product. Therefore it was the amyl alcohol constituent that was rather sought and this was higher in the grain fusel oils. However, early in the present century Perkin accomplished his famous synthesis of rubber and the basis of this was iso-prene a derivative of butyl alcohol. With the prices of rubber soaring as they were at this period, it looked as if this synthesis might be commercially feasible if butyl alcohol could be cheaply obtained.

In 1910 the British firm of Strange & Graham, Ltd. undertook the commercial production of butyl alcohol by fermentation using bacteria of a type first isolated by Fritz. These bacteria apparently are of very wide distribution and occur both on grains and roots. To an extent their occurrence and activities had been overlooked because in an ordinary alcohol mash the yeast or its enzymes rapidly rob them of their food, also they thrive at a temperature higher than the optimum for yeast. Fernbach in 1911 applied for a patent covering the use of one variety of bacteria of this type which he designated Bacteria B F, which he found fermented a potato mash but not a grain mash. This selective action is presumably due to the lower nitrogen content of the potato mashes. In the meantime Charles Weizmann also associated with the same enterprise had isolated a bacteria he called B Y.

The process of making butyl alcohol by the Fernbach bacteria had not reached much beyond the large scale experimental stage when the War began, but it had progressed far enough to demonstrate that very considerable quantities of acetone were produced concurrently with butyl alcohol. With the cordite manufacturers clamoring for acetone, attention was at once turned to this process. The firm of Strange & Graham using the Fernbach bacteria contracted to furnish acetone to the British Government and early in 1915 were supplying a thousand pounds per week. Meanwhile the Nobel Explosives Company looked into the feasibility of using the Weizmann bacteria, and were so much impressed that they persuaded Weizmann to apply for a patent (granted in March 1915) and they established a plant adjacent to their explosives works. The success of this plant was so great that five or six large distilleries were adopted for its operation and the distillery plant of Strange & Graham also changed over to it. Primarily the advantage of the Weizmann bacteria over the Fernbach was the operation of grain. As the war developed and the submarine menace made a shortage of grain in the British Islands, the Weizmann process was operated in a distillery in Toronto and later the British Government bought a large distillery in Terre Haute. When we entered the War the government took over a large Peoria distillery and operated it for this process.

The Weizmann process in essence consists in a selective culture, developing the germs that are most active in production of butyl alcohol and resistant to heat. The fermentation takes place in an unhydrolized mash at 35° to 36° C and is complete in approximately forty-eight hours. The yields are in the proportion of 30% butyl alcohol, 15% acetone and 5% ethyl alcohol. During the war time the acetone was the valuable product and the butyl alcohol largely an almost useless by-product, great quantities were stored and also considerable broken down into ethyl-methyl ketone, which like acetone could be used as a solvent for nitro-cellulose.

New Demands for Acetone

While the original demand for acetone had come from the cordite manufacturers, this process was changed to minimize the quantities required, but meanwhile there had arisen two new demands for acetone, that of tear gases, which we have already considered, and that of airplane dope. For more than a decade before the World War, cellulose acetate had been commercially a sort of technical foundling. When the process for its production was first developed, all manner of prospectively valuable uses were suggested for it, but to a large extent these had never materialized. Airplane wings, however, required a varnish, and as its composition was mys-

terious to the uninitiated, this varnish was called "dope". Acetone was needed as a solvent for the cellulose acetate and the demand for this purpose made up for any slackening of demand for the explosive makers. For the production of cellulose acetate itself the cheap glacial acetic acid from the acetylene aldehyde process was a life saver

With the consideration of the acetone problem and its solution, it may be well to pass from the chemistry of war to the chemistry of peace.

Atmospheric Nitrogen Fixation

In the adaptation to peace-time needs of the progress in atmospheric nitrogen fixation made during the stress of war time, United States of all the great industrial nations has been slowest. As has been pointed out, war time experience demonstrated beyond a shadow of doubt that the Haber process, or modifications thereof, that is, the direct process, is the most economical. This demonstration advisedly halted the great American war plant operation at Muscle Shoals. While it was probably sound for the emergency of war needs to build a plant to operate according to a process that was actually producing in Allied territory and from which operating executives could be summoned, peace changed all such conditions. Germany's experience became in a sense world knowledge, and the problem was altered from that of an available supply of fixed nitrogen at any cost, to the most economical supply.

In other nations this alteration in conditions was perhaps not so marked, because only in America do war clouds become diaphanous immediately hostilities are concluded. Hence in England there is one great fixation plant, but in America — while there are seven or eight plants — the actual production up to the present time has been very small in comparison with European production. This, however, does not mean the problem has not been intensively studied here, for exactly the contrary is the case, but here the change from a defensive to an economic problem has been more clearly recognized, and time and money have been spent to get the best process rather than an operating process. What actual production has taken place has been either experimental or where there has been by-product hydrogen. The American production, relatively meagre as it has been, has not been without its economic effect, as the price of ammonia has declined until it is about one-third that of the pre-war times.

Coal Tar Dyestuffs

When one contemplates the vast American coal tar dyestuff industry of today, no one would think of comparing its production with the annual purchases of candy by the Woolworth stores, yet that was the deprecatory comparison made as late as 1915, but the developments of picric acid and trinitrotoluol as military explosives once and for all time indissolubly linked the peace time color factory to the war-time explosive industry. The war-time antecedents of another now great industry has not, however, been so much emphasized nor become so trite. Of the great multitude who admire the sturdy finish on the bodies of their automobiles, the variety of the colors, the lustre that is practically as permanent as the car itself, how many think of the lacquer industry as an offspring of the Great War.

Paint, as well known, consists of a vehicle and a pigment, while lacquers consist of a pigment, a plastic and a solvent. Previous to the Great War there was one plastic for lacquer celluloid. Celluloid is gun cotton made plastic by camphor, a typical example of that scientific vagueness, a solid solution. Before the war there were two limitations on the extension of the lacquer industry, the relative scarcity and high price of camphor, and the likewise relative scarcity and high price of the solvents, fusel oil and its derivatives. No guide boards are needed to connect gun cotton, nitrated cellulose with war activities. The Weizmann process makes twice as much butyl alcohol, or butanol as it is now popular to call it, as it does acetone.

Lacquer Development

When the war ended, there were great quantities of butanol available and it was soon ascertained that it and its derivatives had the valuable solvent properties of fusel oil. Further the greater the demand the more cheaply it could be made. Also there were great quantities of nitro cellulose to be salvaged to the arts of peace. The handicap of camphor scarcity was met by the gradual development of a wide variety of compounds as plasticizers, that could in part or entirely replace camphor. Among these may be mentioned the tri phenyl and tri cresyl phosphates, really prewar products, ethyl and butyl phthalates, butyl stearates, in fact a vast range of esters. Then the Weizmann process was not alone the contributor to this industry provided by the war time search for acetone. Ethyl acetate is a valuable lacquer solvent, indeed it must be particularly emphazised, that a modern lacquer is a carefully balanced formula according to the purpose for which the lacquer is to be used, and the alcohol distilleries which made acetic acid for war purposes now utilize it to make ethyl acetate. The American invention by which such esters are made in the vapor phase and thereby utilize dilute acid is a valuable contribution to this industry.

The manufacture of explosives and connected and contributory industries have a partner in this peaceful lacquer industry, as they did in their task of obliterating the enemy. Until mustard gas became as important as T N T, few chemists had thought of ethylene since first year organic chemistry. Both in Germany and by the Allies, the ethylene for mustard gas was obtained by the dehydration of alchol.

Where cost is of minor consequence the production of ethylene from alcohol is perhaps not illogical, except that alcohol production to a large extent consumes products that have a food value and the fermentation itself is extravagant as about one half the carbohydrate molecule is wasted as carbon dioxide; but for peace time purposes, ethylene from this source goes back to its place in the pages of the text book. On the other hand, there are alternate sources of ethylene; coal gas contains from four to six per cent. ethylene oil gas made by destructively distilling crude oil contains, however, upwards of thirty-five per cent. fibre, would have unquestionably been much slower in reaching its present high degree of achievement, had it not been for the expansion induced by the use of cellulose acetate as air plane dope.

War Brought Improvements

Many improvements in the technical industries, minor perhaps in magnitude, but nevertheless of especial value, can be traced to the intensive study of war time. The attention given to phenomena of absorption by charcoal in the contrivance of the gas mask is reflected not only in the tremendously increased efficiency of decolorizing carbons, but in all sorts of catalytic processes. The improvement in fumigation due to familiarity with war gases is rather obvious, but the use of smoke insecticides of the same origin probably will be of more ultimate importance. Great, however, as already have been the peace time gains from the intensive work of war times really the most valuable in potentiality is the co-operation it inspired between the scientist and the industrialist the university and the factory, and the general recognition by the public that the Chemical Age has arrived.

Ways and Means Committee of the House announces that hearings on revisions of existing tariff schedules on chemicals, oils and paints will be held January 7, 8 and 9. This is in line with a program for general revision of the tariff which it is believed will be undertaken at a special session of Congress in the Spring or Fall of 1929. Among the other hearings on tariff schedules, in addition to those on chemicals, oils and paints, made public December 4, by Chairman Hawley of the House Committee were: earths, earthenware, glassware, January 10, 11; metals and manufactures of, January 14, 15, 16; sugar, molasses and manufactures of January 21, 22; and agricultural products and provisions, January 24, 25 and 28.

Beryllum glass is produced by Chi Fang Lai, Chinese research fellow, University of Pittsburgh, working with Alexander Silverman, head of the chemistry department. This glass is of value in optical work because of its superior hardness, and in treatment of rickets and other diseases because it allows ultra-violet rays to penetrate. In making the glass, beryllum oxide was successfully substituted for soda lime silicate, used in ordinary glass.

British, French and Japanese governments have agreed on the terms of a warning to the Nationalist government of China that they have not accepted recently announced changes by the Chinese minister of Finance concerning the method of collection of the salt tax.

Lord Birkenhead, British Jurist and Statesman, Joins Board of I.C.I.

Frederick Edwin Smith, 56, Lord High Chancellor of Great Britain (1919-1922), First Baron of Birkenhead, 1919, First Earl of Birkenhead (1922), and Secretary of State for India (1924-28), joins the Imperial Chemical Industries, Ltd., as a director, at a salary of $10,000 a year and a share of one-half of one per cent. in the profits. Last year his percentage would have amounted to over $100,000 since the I. C. I.'s profits for that year were $20,164,585.

Lord Birkenhead has been one of England's most colorful political figures for almost a generation. He has the reputation of being the "lion" of any gathering, whether large or small, public or private. As Lord High Chancellor, his quick legal mind, withering scorn, sphinx-like attitude and immobile face, made him one of the best and most cordially hated of English jurists. As Member of Parliament, his brilliance in public debate and his supremely persuasive power made him often favored by the Conservatives for Premier. Brilliancy and resourcefulness are perhaps his outstanding characteristics.

Although he has been successful as often as any man in England, he has no false pride. When the question of title came up he selected Birkenhead, thus making famous this rather unprepossessing town of his origin which is but little older than himself. When he resigned the portfolio of Secretary of State for India he announced that he did so because he found his salary of $25,000 a year not enough to provide for the future of his family. On one of the many occasions when he returned to Birkenhead School, where as "Freddy" Smith he got his start, he uttered the following gem in the course of his talk to the pupils. "While you are young, cultivate the habit of industry. I regret that I never did so."

In his new position with Imperial Chemical Industries, Lord Birkenhead will be associated with some of the best names in British industry. Lord Melchett is chairman, Sir Harry McGowan is deputy chairman, and other directors include Lord Ashfield, Lord Colwyn, Lord Read and Sir Josiah Stamp. Just how he will fit in here, or what his contribution will be to the chemical industry is as yet undetermined, but judging by his past record, his lordship will not leave the matter long in doubt.

The Royal Dutch Shell plans to work with the Koninklijke Hoogovens of Ijmu iden in producing artificial fertilizers and synthetic ammonia. The project will be begun on a small scale at first with a capacity of 10,000 tons of pure nitrogen a year, manufactured by the Mont Cenis process.

A committee has been named by the Australian Quicksilver Mining Co., Melbourne, to carry on negotiations looking toward amalgamation with the New Jamieson Quicksilver Mines. One offer made by the latter concern has been rejected by the stockholders of the Australian Quicksilver Mining Co.

Imports of calcium chloride into the United States which in 1927 reached 13,027,889 pounds, have more than doubled since 1923 when imports of this commodity amounted to but 6,464,602 pounds. Practically all of these imports are supplied by Germany.

Santiago Saciocello Co., a Chilean firm, has purchased the entire nitrate holdings of Lockett Brothers, a British company, for a reported consideration of £100,000.

The Chemical Industry Benefits

from the

Increasing Rayon Production

The rapidly increased growth of the rayon and lacquer industries during the past two years is advanced as one of the reasons for the excellent volume of heavy chemical business during 1928. A study of the authentic figures of chemicals consumed in the first of these two industries leaves no doubt as to the authenticity of the story.

THE rayon industry is now working on plans for a great increase in the consumption of chemicals in the manufacture of all kinds of rayon yarns. The average chemical manufacturer will hardly appreciate the importance of this movement to him and to his industry, and it is for this reason that we are giving this exposition with the avowed purpose of showing the chemical industry the real significance of the definition of rayon as a chemcial yarn and of emphasizing to him the great opportunities that the rayon industry offers the chemical manufacturer for the sale of chemicals.

Two points must be emphasized before we can proceed to the discussion of our main theme. The chemical manufacturer must first understand what rayon is, must know that there are different kinds of rayon and that the chemicals used by the rayon producer varies in accordance with the nature of rayon that he makes. Secondly, he must appreciate the development that is now going on in the rayon industry and the importance of the change in the mind of the textile men as to what the rayon of the future will be.

It is scarcely necessary to mention that there are now four principal rayons, namely viscose rayon, nitro rayon, cuprammonium rayon and acetate rayon. The first three are also known as regenerated celluloses while the last, acetate rayon, is an ester of cellulose, namely cellulose acetate. The term, regenerated cellulose, infers that the cellulose is first dissolved in a solvent or changed in chemical composition so that it will dissolve and then it is allowed to return to the original cellulose state, not completely, of course, but far enough so that the original strength characteristics are secured to a degree.

The rayon industry is constantly using large quantities of chemicals not only to convert the cellulose into soluble form, but also large quantities of solvents to dissolve the converted cellulose. The rayon industry also uses great amounts of chemicals to coagulate the spun filament. Finally chemicals are employed to change the characteristics of the rayon, as for example in the production of a filament with duller luster, that is a delustered rayon, and to bleach rayon. In the further processing of rayon additional chemicals are employed, but we are not concerned with them here, limiting ourselves only to the consumption of chemicals by the rayon producer alone.

Viscose rayon, the most important type, is made in large quantities both here and abroad. Its production in this country is much more than all other types combined. As it is estimated that the production of rayon in the United States will be 100,000,000 pounds in 1928, at least 82,000,000 pounds will be viscose rayon. Viscose rayon is made in this country by the Viscose Co. at its plants located at Marcus Hook, Pa., Lewiston, Pa., Roanoke, Va. and Parkerburg, W. Va., by the du Pont Co. at its plants located at Buffalo, N. Y., Old Hickory, Tenn. by the Industrial Rayon Corp. at its plant located in Cleveland, by the Delaware Rayon Co., New Castle, Del., by American Glanzsoff Corp. at Elizabethton, Tenn., by the Belamose Corp. at Rocky Hill, Conn., by the Skenandoa Rayon Co. at Utica, N. Y., by the Acme Rayon Corp. at Cleveland, O. Additional companies that have been organized for the manufacture of rayon by the viscose method and that are building plants at the present time are the American Chatillon Corp. at Rome, Ga., American Enka Corp. at Asheville, N. C., Woonsocket Rayon Co., at Woonsocket, R. I., New Bedford Rayon Co. at New Bedford, Mass. A company is also building a plant for the manufacture of viscose rayon at Burlington, N. C. The name of this company is not available at the present time, and the plant is commonly called the Johnson plant.

These new plants will very likely come into production during the year 1929. In addition thereto, the du Pont rayon plant, located at Ampthill, Va., will also come into production during the year 1929 probably about July of that year. It should also be mentioned that the Industrial Rayon Corp. is building a new plant at Covington, Va., which will also start operating some time during 1929.

The production of viscose rayon during the year 1928 should reach a total of 82,000,000. As is well-known viscose rayon is made from bleached sulphite wood pulp, this means that at least twice as much sulfite pulp will be consumed during this year for the manufacture of viscose rayon. This volume of pulp must be considered entirely as additional production for the pulp industry which still has to take care of the requirements of the paper industry for sulfite pulp. The additional consumption of chemicals, such as sulfur, lime, bleaching powder, etc., for the manufacture of this additional amount of rayon pulp has had an important effect on the chemical market and is directly due to rayon.

Chemicals in Viscose Rayon

But the manufacture of viscose rayon requires the use of certain important chemicals, and these are caustic soda, sulfuric acid and carbon disulfide. It takes approximately two pounds of caustic soda to make one pound of viscose rayon and hence the consumption of caustic soda for this purpose in 1928 will be 164,000,000 pounds or 82,000 tons. It requires one and one-half pounds of sulfuric acid to make one pound of rayon, the acid being used as the coagulating medium to bring about coagulation of the viscose filament directly after it is spun. The consumption of sulfuric acid for viscose rayon manufacture during 1928 will therefore amount to 123,000, 000 pounds or 61,500 tons. Carbon disulfide us used to convert the alkali cellulose, which is first made by treatment of pulp with caustic soda, into the xanthate. It requires about six-tenths of a pound of the carbon disulfide per pound of viscose manufactured. Hence in 1928 the consumption of this chemical in the manufacture of viscose yarn will be 49,200,000 pounds or 24,600 tons. There are of course other chemicals which are used in this process, such as bleaching powder, which is used in quite large quantities to bleach the viscose rayon yarn. This is done as a general rule in the plant of the producer. Mention must also be made of chemicals such as zinc sulfate, epsom salt and others which are added to the coagulating bath in order to dull the lustre of the viscose rayon and make delustered grades which are very much in demand at the present time for the manufacture of hosiery. However, the consumption of these latter does not approach in any way that of the three principal chemicals mentioned above.

82,000,000 Lbs. Viscose Rayon This Year

It is a matter of record that of the total of 82,000, 000 pounds of rayon being manufactured by the viscose process in 1928, 52,000,000 pounds are made by the Viscose Co., and 19,000,000 pounds by the du Pont Rayon Co., while four million pounds will be made by the Industrial Rayon Corp. The remainder, 15,000,000 will be made by the other viscose producers listed above. The Viscose plant located at Roanoke, Va., is the largest single rayon manufacturing plant in the world. There are 5,600 employees at this plant, and it has a potential output of twenty million pounds of viscose rayon a year. The extent of this company's activities in the rayon field this yield may perhaps better be appreciated when it is realized that it has been making rayon at the rate of one million pounds a week, consuming 2,000,000 pounds of caustic soda, 1,500,000 pounds of sulfuric acid and 660,000 pounds of carbon disulfide weekly to make this production.

The chemical industry will be interested to learn what the coming year, 1929, has to offer it in the way of opportunities of selling chemicals to the viscose rayon industry. Viscose rayon production during the year 1929 will be at least 100,000,000 pounds. The increase in the production of viscose rayon will come not only from new plants that will come into production during that year but also from old plants whose productive capacity will be increased. Thus the du Pont Co. is building a very large plant for making viscose rayon in super-extra and multi-filament yarn at Ampthill, Va., near Richmond. This plant will turn out about 3,200,000 pounds of viscose rayon a year, as it is now planned. The plant will be operating at full capacity by November 1929.

New Rayon Plant Sites

The Industrial Rayon Corp. is also building a new plant to manufacture rayon by the viscose process at Covington, Va. This plant is also expected to start operating sometime in 1929. The American Enka Corp. is erecting a plant at Asheville, N. C., which is to have an annual production of 10,000,000 pounds of viscose rayon. This plant will also start operating in 1929 and will be the largest plant making viscose rayon next to Viscose and du Pont. It is said that about 4000 operatives will be employed in this plant. American Chatillon Corp. is building a plant at Rome, Ga., for the manufacture of rayon both by the viscose and the acetate process. The capacity of the plant to make viscose rayon will be 12,000 pounds daily. It is expected that the plant will commence operations some time in 1929 and by 1930 the capacity of the plant to make viscose rayon will have been doubled.

Furthermore, it is quite possible that the Woonsocket Rayon Co. will be making large quantities of viscose rayon in 1929 at Woonsocket, R. I., as well as the New Bedford Rayon Co., at New Bedford, Mass., and the Burlington Rayon Co. at the Johnson plant in Burlington, N. C. (The real name of this rayon company is still unknown).

This increase in the production of viscose rayon making a total of 100,000,000 pounds means that there will be required for this manufacture 200,000, 000 pounds of pulp, 60,000,000 pounds of carbon disulfide, 200,000,000 pounds of caustic soda and 150,000,000 pounds of sulfuric acid. These stupendous quantities of chemicals that will be consumed in 1929 by just the viscose branch of the rayon in-

dustry alone clearly demonstrate why rayon is called one of the principal chemical industries. The viscose rayon manufacturers will also consume larger amounts of bleaching powder for bleaching rayon and other chemicals which are used in the manufacturing operations.

Nitro Rayon Ranks Second

Next in importance of the rayon yarns made in this country from the standpoint of production is nitro rayon. Nitro rayon is also known as Chardonnet rayon, Count Chardonnet being the first to make it on a commercial scale. It is in fact the first rayon to be manufactured on such a scale and sold to the public. Nitro rayon is a regenerated cellulose and is manufactured by treating cotton linters with mixed acid, that is an acid which contains certain definite proportions of nitric and sulphuric acid. After nitration the cellulose nitrate is dissolved in a mixture of ether and alcohol and then spun. The spun filaments are then denitrated by treatment with a sulfide. This type of rayon also requires some bleaching. The important chemicals used in its manufacture are mixed acid, ether, alcohol, a sulfide and ammonium sulfate.

Alcohol, Ether Consumption Large

Tubize Artificial Silk Co. of America at Hopewell, Va. is the sole American maker of nitro rayon. This plant will make about eight million pounds of nitro rayon in 1928, will consume about the same weight of cotton linters and about 31 pounds of mixed acid for every pound of nitro rayon or 248,000,000 pounds. This is a gross figure and the net consumption is of course less due to the recovery and reuse of spent acid. For every pound of nitro rayon made there are required about one gallon of ether and about 0.6 gallon of alcohol. Here again the figures are gross for a certain amount of alcohol and ether is recovered in the manufacturing operations. The total gross consumption of alcohol will therefore be 480,000 gallons and that of ether 8,000,000 gallons. In addition thereto there are consumed for denitration four pounds of calcium monosulfide and two pounds of ammonium sulfate per pound of rayon. This makes a total of 32,000,000 pounds of calcium monosulfide and 16,000,000 pounds of ammonium sulfate. It of course is possible that other denitrating chemicals, such as ammonium sulfide and sodium sulfide may also be used in the place of the chemicals mentioned.

Inasmuch as the plans of the Tubize Artificial Silk Co. of America call for a production of ten million pounds of nitro rayon during 1929, there will be consumed a total of 310,000,000 pounds of mixed acid (gross), six million gallons gross of alcohol, ten million gallons gross of ether, forty million pounds of calcium monosulfide and twenty million pounds of ammonium sulfate.

Cuprammonium rayon is made by dissolving cellulose in ammoniacal copper oxide spinning the solution and coagulating by means of sulfuric acid or caustic soda. Cuprammonium rayon is a very fine type of rayon, particularly well suited for certain knitting and weaving purposes, and is today increasing in production to a very large degree both in this country and abroad. It is a simple rayon to make in comparison with the other rayons, particularly viscose and nitro rayon. There are four companies that operate cuprammonium rayon processes in this country at the present time, but only one of these is of great importance. This is the American Bemberg Corp. whose plant is located at Elizabethton, Tenn. The production of this company in 1928 will amount to three million pounds. The other companies that have cuprammonium processes but that do not figure as yet in the production of this type of rayon are Napon Rayon Co. at Clifton, N. J., Furness Rayon Co. at Gloucester, N. J. and Rosland Rayon Corp. at Patterson, N. J.

For every pound of rayon made there are required about 0.4 pounds of copper and 1.5 pounds of ammonia. This, then, means a total consumption for 1928 of 1,200,000 pounds of copper and 4,500,000 pounds of ammonia. During the year 1929 the consumption of these chemicals will increase for the reason that the production of cuprammonium rayon will increase to five million pounds. This will therefore mean a consumption of two million pounds of copper and 7.5 million pounds of ammonia.

Chemicals in Acetate Rayon

The last rayon to be considered is acetate rayon. This is also the last rayon developed in point of time. It is not a regenerated cellulose but a new cellulose compound, namely cellulose acetate. Cotton linters are the raw material and this is treated with acetic anhydride, glacial acetic acid and a catalyst, usually sulfuric acid, to make cellulose acetate The latter is then dissolved in acetone and the solution is spun. A good proportion of the acetone solvent is recovered as it evaporates and leaves the filament in solid form. Up to the present time only one company in the United States has been manufacturing acetate rayon, namely the Celanese Corporation of America at Amcelle, Md. The total production of acetate rayon during 1928 will be four million pounds. This production will be increased to eight million pounds during 1929. During 1929 three new acetate rayon producers will be added to the list of American manufacturers. These are the Viscose Co., the du Pont Co. and the American Chatillon Corp. The first company is building a plant at Meadville, Pa., the second at Waynesboro, Va. and the third at Rome, Ga.

It is estimated that approximately two pounds of acetic anhydride are used to make one pound of acetate rayon. All of this chemical is consumed in the process, and hence this means a consumption of

four million pounds of acetic anhydride in 1928 and eight million pounds during 1929. Furthermore, two pounds of glacial acetic acid are used to make one pound of rayon, but eighty per cent. of the acid is recovered, making a net consumption of 0.4 pounds per pound of acetate rayon. This indicates a total consumption of 1.6 million pounds of glacial acetic acid in 1928 and 3.2 million pounds in 1929. While four pounds of acetone are used for every pound of acetate rayon produced, nevertheless from 95 to 97 per cent of the acetone is recovered.

United States Shellac Importers' Association, November 20, decides to refer the matter of excess arsenic (orpiment) in orange shellac to a special committee with instructions to formulate a rule and proper penalties for infraction thereof.

Excess of arsenic in orange shellac has been growing steadily for some time. The arsenic content is controllable because it is put into the shellac during the manufacturing process in India. A normal arsenic content is two-tenths of one per cent., but of late as much as one per cent. has been found. This excess has caused trouble in wood-finishing processes, there being a tendency of the finish to turn green.

In addition to providing a rule and penalties similar to the requirements of the association regarding insolubles, the chemist committee of the association has caused to be worked out an accurate method of chemical analysis whereby arsenic content may be determined.

Association of Consulting Chemists and Chemical Engineers is organized in New York at a meeting held at the Chemists' Club, November 9. Constitution and by-laws were adopted and the following officers elected: president, Hal T. Beans, Columbia University; vice-president, Irving Hochstadter, Hochstadter Laboratories; secretary, Clarence V. Ekroth, Ekroth Laboratories; and treasurer, Jerome Alexander. The following directors were elected: Charles V. Bacon, Frank C. Gephart, Robert Schwarz, Albert M. Smoot, Albert G. Stillwell, Arthur W. Thomas, John M. Weiss and Thomas A. Wright. Additional information may be obtained from the secretary at 461 Eighth ave., New York.

Invention of an unbreakable glasslike substance which cannot be cut by a diamond or broken by a hammer is reported in England, the Department of Commerce has been informed. A factory is reported to be in the course of construction at Nottingham for the manufacture of this substance. Machinery will be largely employed, so that less manual labor will be needed than in the manufacture of glass. E. C. Baly, of Liverpool University, and Fritz Pollak, of Vienna, have collaborated in perfecting this glasslike substance, originally invented by Doctor Pollak.

Lead Industries Association is organized by producers and manufacturing consumers of lead at meeting in Hotel Roosevelt, New York, November 14. The following officers were elected: president, Clinton H. Crane, president, St. Joseph Lead Co.; vice-presidents, Hamilton M. Brush, vice-president, American Smelting & Refining Co.; and Ralph M. Roosevelt, vice- president, Eagle-Pitcher Lead Co.; secretary-treasurer, Felix E. Wormser, 25 W. 43rd st., New York.

Chicago Drug & Chemical Association will hold its annual banquet, December 19, at the Hotel Stevens, Chicago. Only members of the association will be in attendance.

Oil Trades Association, New York, holds Fall meeting and beefsteak dinner at the Waldorf-Astoria Hotel, November 14.

The Industry's Bookshelf

Trade Associations, by Benjamin S. Kirsh, 271 pages, Central Book Co., New York.

Although the sub-title is "The Legal Aspects," this work on a most important phase of intramural industrial relationships, stresses equally the economic aspects of the problems involved in trade associations. It is a keen analysis of policies and practices and gives thorough consideration to the functions and problems generally encountered. The author was formerly special assistant to the United States Attorney in New York in the prosecution of Sherman Anti-Trust cases, so that what he has to say should prove of practical value.

Petroleum and Its Products, by William A. Gruse, 377 pages, McGraw-Hill Book Co., Inc., New York.

With petroleum chemistry rapidly increasing in its economic importance, this book doubtless fills a very well-defined need for an authoritative work upon the subject of petroleum technology. It is extremely technical in nature but to those to whom its appeal is directed, the many investigators now beginning or engaged in scientific studies of petroleum, its usefulness should be unquestionable.

Water Purification, by Joseph W. Ellms, 594 pages, McGraw-Hill Book Co., Inc., New York.

This is the second edition of this work on the art of water purification. More recent data has been added to supplement the material contained in the first edition published in 1917. It deals with the properties of various classes of water, the relation of water to public health, and the various steps in purification processes. Invaluable both as a text and a reference book.

Industrial Chemistry, by Emil Raymond Riegel, 649 pages, Chemical Catalogue Co., Inc., New York, $9.00 net.

Here is presented a panorama of the numerous commercial activities which make up industrial chemistry. It is a thorough and scholarly work but presented in a most interesting fashion, thus making it suitable for the general reader as well as for the student of industrial chemistry.

Substantial savings in freight charges have been effected by the Massachusetts gas companies by arranging for the loading of sulfate of ammonia direct to barges and other vessels at their docks in Everett, whereas the former policy was to load into cars and transfer by rail to Charlestown, where the vessels were moored. About six weeks ago the first cargo to go from the Everett docks direct went out in the barge "Severn", destined for Baltimore, and consisting of cargo valued at close to $50,000.

Existing appliances in the terminal at Everett were found adaptable to the handling of ammonia sulfate, picked up by a conveyor in the warehouse and poured into the company's hopper bottom cars, holding about 80 tons each. The cars were then weighed and the sulfate covered with paper to furnish protection until arrival of the barge. After cars reached a point alongside the barge, and examination showed the barge thoroughly clean, the cars were switched over the hopper leading to the belt that is used for loading water shipments of coke. A special canvas net was spread under the conveyor belt and the loading proceeded.

Tariff Commission announces that the public hearing set for December 11, 1928, at the offices of the Commission in Washington in the investigation, of the costs of production of linseed oil, will be postponed until 10.00 o'clock a. m., Tuesday, December 18, 1928, at the same place.

Formation of Benzol and Hydrocarbons by the Action of Heat Methane

By Franz Fischer
Kaiser-Wilhelm-Institute für Kohlenforschung

THE decomposition of pure methane by the action of heat yields according to information in scientific literature, carbon and hydrogen according to the equation $CH_4 = C + 2H_2$. In the presence of catalyzers as nickel, cobalt, and iron the equilibrium point is more quickly reached.

Bone and Coward investigated the thermal decomposition of methane at different temperatures in a porcelain tube without the presence of a special catalyzer, and they also obtain the result that methane is decomposed substantially into carbon and hydrogen. However, their work contains hints from which we can conclude that when methane is decomposed, even if in very small quantities, there may arise other products in addition to carbon and hydrogen depending on the conditions of the experiment. Table I shows the results of five experiments, in which methane was heated in a closed porcelain tube to about 1,000° for different periods of time.

This paper was adjudged one of the best among the many delivered before the Second International Conference on Bituminous Coal held at Carnegie Institute of Technology, November 19-24. Its relation to the chemical industry should make it of particular interest to the readers of Chemical Markets.

Bone and Coward point to the fact that the formation of acetylene or of unsaturated hydrocarbons could be discovered only in the experiments in which the methane concentration at the end amounted to more than 60 per cent., and that upon a further reduction of the methane concentration the gas in contact with the hot walls continued to decompose directly into its elements. Bone and Coward add that in harmony with the above, there was an indication of the formation of aromatic hydrocarbons only in case of a high methane concentration from the fact that a light vapor appeared when the gas which had been heated came out of the cooling coil.

Bone and Coward give no information concerning the fact that aromatic combinations were detected, or concerning a quantitative determination of their mass.

W. C. Slater investigated the influence of surfaces of different materials on the decomposition velocity of methane at 910°. He found that quartz, aluminium oxide, magnesium oxide, and barium oxide did not materially accelerate decomposition, while wood charcoal, graphite, carborundum, iron, and copper did. He had the methane enclosed in a porcelain tube; the gas was heated five minutes at a time, and then the degree of decomposition was determined. Slater mentions emphatically that the remaining gas contained nothing but methane, hydrogen and a trace of nitrogen.

R. C. Cartelo also investigated the thermal decomposition of methane. He arrives at results varying somewhat from those of Mayer and Altmayer, and calculates according to the Nernst formula the equilibrium concentrations of ethylene and of acetylene which may be formed by the separation of hydrogen from methane and the union of two residues. These amounts are exceedingly small.

In older literature one finds, however, occasional references concerning the occurrence of other hydrocarbons, when methane is decomposed by heat. Berthelot, and before him, others, found that when methane is passed slowly through faintly glowing procelain tubes, traces of naphthalene are formed, which, however, were not determined quantitatively. Berthelot also mentions that he proved qualitatively the occurrence of traces of benzol. He passed several liters of methane through a red hot tube, and led the escaping gas through fuming nitric acid. He proved the formation of traces of nitrobenzene by reduction to aniline and the identification of the latter by color reactions. He did not isolate either nitro-benzene or aniline as such, but there is no doubt, as we shall see later, as to the correctness of his observations. He expresses the opinion that benzene and naphthalene were formed from traces of acetylene, which in its turn originated from the methane at red heat.

The occurrence of small quantities of naphthalene has certainly also been observed since that time, and former collaborators and myself have detected it on several occasions. But only a short while ago did the

opportunity present itself for a more thorough study of the conditions under which hydrocarbons, rather than carbon and hydrogen, appear as the product of the thermal decomposition of methane. It was to be determined whether it were possible by changing the conditions of the experiment, to produce larger quantities of unsaturated and aromatic hydrocarbons by the decomposition of methane, instead of the traces mentioned before. Methane alone and not its homologs were to be examined. The thermal decomposition ability of the latter is already well known. Further, the decomposition of methane below 1,200° was to be studied, that is, at temperatures, which were easily attainable without the use of electrical energy. Moreover, the formation of acetylene out of methane in the electric arc has been known for some time.

In the thermal decomposition of methane flowing through a tube it could be conceived that by shortening the period of heating, the complete separation of the hydrogen from a methane molecule could be prevented, so that unstable groups such as CH_3, CH_2, or CH appear temporarily, and then would associate in some way or polymerize. In this work I was aided by knowledge gained in previous years in a series of experiments on the formation of ozone, hydrogen peroxide and nitric oxide at high temperature; here the cooling rate was of the greatest importance. I believed that this should be true also in the study of the thermal decomposition of methane.

From this point of view, it seemed clear that the flowing velocity, or in other words, the duration of heating, must be of just as great importance in the formation of larger quantities of hydrocarbons, as the temperature of heating. For this reason we conducted numerous experiments on the influence of the duration of heating; experiments on the influence of the velocity of cooling are to follow at a later time. We have, on the other hand, already paid attention to the importance of catalyzers, as well as to a number of other factors.

TABLE I

	Duration of Heating				
	1 minute	5 minutes	15 minutes	30 minutes	60 minutes
	Composition of the reaction gases in volume per cent.				
C_2H_2	0.5	0.5	0	0	0
Heavy H. C.	0.3	0.5	1.3	0.35	0
CH_4	90.4	75.4	65.25	62.85	48.2
H_2	8.8	23.6	33.3	36.8	51.2

Table II shows experiments in which methane was passed at various speeds through a porcelain tube, 16 mm. in diameter. With a gas velocity of 4 liters per hour and a tube temperature a little below 900°, there began to appear in the escaping gas a slight amount of vapor, and an expansion of three per cent. was measured. With rising temperature the formation of vapors rapidly increased; their color which was whitish at the beginning, became darker, and at 950° it was dark brown. Above this temperature the formation of oil and tar decreased and that of carbon increased, which could be easily observed in the color of the vapors. At the same time the gas smelled strongly of naphthalene, and naphthalene crystals were deposited in the receivers. At 975° the expansion amounted to 12 per cent.; at 1,000°, 19 per cent. Black clouds of soot, had taken the place of the tar vapor and the former clogged the tube after some time.

In order to prevent the decomposition of the methane into carbon and hydrogen, we increased the velocity of the gases passing through the heated tube.

TABLE II

Gas Before The Experiment, °C.								
Number	Heavy H.C.	H_2	CH_4	C_2H_6	Temperature	Time	Liters per hour	Exp.
					°C.	*hours*		*per cent.*
1	1.8	0.0	93.0	0.0	900	—	4	3
2	—	—	—	—	975	—	4	12
3	—	—	—	—	1,000	—	3.85	19
4	—	—	—	—	1,050	4	70	6
5	—	—	—	—	1,100	4	70	10
6	—	—	—	—	1,150	$1\frac{2}{3}$	70	21

Gas After the Experiment							
Number	Heavy H.C.	H_2	CH_4	C_2H_6	Oil	Tar	C
1	—	—	—	—	—	—	—
2	2.8	23.0	66.5	0.0	—	—	—
3	2.7	39.3	55.0	0.0	—	—	—
4	2.6	12.6	79.7	0.0	6.5 g.	1.6 g.	Very little
5	3.4	14.7	77.5	0.0	9 g.	4.5 g.	1 g.
6	4.2	41.8	50.4	0.0	4.2 g.	3.5 g.	3.1 g.

At a constant temperature the vapor immediately began to become clearer, and the formation of soot occurring in considerable amounts at 1,000° stopped immediately. At 70 liters an hour we obtained at 1,050° an expansion of six per cent., and in four hours, 6.5 grams light oil, 1.6 grams tar, and but very little carbon was deposited on the walls of the tube. At 1,100° to 1,110° the expansion varied from 10 to 11 per cent. In four hours, 9 grams oil, 4.5 grams tar and one gram carbon were formed. The vapors were again somewhat darker than in experiment four, which was also borne out in the ratio of the oil to the tar; however no soot was found in the gases leaving the reaction tube. Upon a further increase in temperature the color of the vapors passed through various shades of brown and became black, which was to be attributed to the above mentioned formation of soot. At 1,150* to 1,160* (experiment 6) the expansion was 21 to 22 per cent. In one hour and 40 minutes 4.2 grams oil, 3.5 grams tar, and 3.1 grams carbon were formed. After one and three-fourths hours the tube was completely clogged by voluminous soot formation.

Thus the first experiments showed: (1) that a relatively high temperature is required to attain a satisfactory yield; (2) that with rising temperature the appearance of free carbon increases rapidly; (3)

that this undesirable decomposition can be prevented by a suitable increase in velocity of the gas.

The necessity of having to use high gas velocities in order to work against the decomposition of the methane into carbon and hydrogen, induced us to use reaction tubes with the least possible cross section. In the experiments one to three of Table III we used porcelain tubes having 5 mm. or even 4 mm. for their inside diameter. Here (experiment 1) a yield in oil plus tar equal to 12 per cent. of the weight of the methane put through was reached. Corresponding to the smaller cross section of the tubes (19 mm. to 47 mm. in the double tube and 201 mm. in the wide porcelain tube) less gas was put through in these experiments. In experiments four and five a quartz capillary tube was used. It was proved that quartz does not accelerate the decompoition of CH_4, into C and H_2, but makes possible the collection of the by-products desired by us. In experiment five the yield in oil and tar amounted to 12.9 per cent. of the methane.

In the course of our investigations we found that the material of the tube had a considerable influence on the direction of the reaction. In using tubes of Marquard paste (Marquard-Masse), for example, it was established that the decomposition of methane into carbon and hydrogen is favored. Berlin hard porcelains and quartz were best suited as materials for our reaction tubes. Starting with the intention of keeping the reaction temperature as low as possible, we investigated also the influence of different catalyzers.

In several experiments a thin porcelain tube, 5.5 mm. in diameter was used, into which an iron wire-2 mm. in diameter was laid. The iron caused a somewhat higher yield but this resulted in an increase in the separation of carbon; the effect of copper was similar but not so marked. In several other experiments the influence of tungsten wire or of molybdenum wire was tested. Both these metals in wire form showed no catalytic influence. At another time an iron boat that contained caustic potash was pushed into the porcelain tube, and methane was passed over it at different temperatures. In this case at 650° a strong decomposition set in. The gas produced at this temperature contained 4.6 per cent. H_2; at 750°, 10 per cent.; at 1,000, 56 per cent. Neither oil nor tar was formed, but, on the contrary, abundant quantities of carbon. Let us mention several further observations: graphite accelerates the separation of carbon; however, tin and silica-gel do not.

The influence of a preliminary treatment of the porcelain tube on its catalytic behavior was also investigated. Preliminary treatment with gaseous hydrochloric acid and treatment with boric acid or hydrofluoric acid showed no noticeable influence.

In our experiments we investigated examples of methane of different origins and purity as well as mixtures with other gases. Table IV gives an outline. The experiments were conducted, partly in narrow porcelain tubes and in narrow quartz tubes, partly also in double tubes, which were constructed in such a way that a closed porcelain tube with an exterior diameter of 14 mm. was pushed into a porcelain tube that had an interior diameter of 16 mm. The gas passed through the narrow intervening space.

Purified Concordia methane, methane from the Neuengamme gas well near Hamburg, as well as a gas coming from the Emschergenossenschaft which had resulted from fermentation, behaved like the methane of Concordia in Oberhausen used for the rest of the experiments. In experiment five we used methane made from aluminum carbide which was free from all other hydrocarbons. Here the especially favorable ratio of light oil to tar is noteworthy under the conditions chosen.

Illuminating gas with only 23 per cent. CH_4 showed also the characteristic formation of vapors, but at a somewhat higher temperature. This is also true of an experiment in which hydrogen and methane were mixed in about the ratio of 3.1, and of a gas that had already reacted once and was passed for a second time through the heated tube.

A comparison of the behavior of the individual kinds of methane with analogous experiments described before, showed no essential differences. If methane is diluted with other gases then the reaction temperature must be raised if it is desired to obtain the same methane transformation. This fact could be especially well observed in experiments where under certain conditions pure methane gave off brown vapors, and upon the addition of nitrogen, carbon monoxide, or carbon dioxide, the vapors cleared up at once. If the temperature was raised somewhat, then in all cases, in spite of the presence of the mentioned gases, the formation of vapors began, i. e., formation of oil and tar started.

TABLE III

RESULTING GAS: "CONCORDIA METHANE"

Number	Tube, Inside Diameter	Temperature	Time	Liters per hour	Exp.	Heavy H.C.	H_2	CH_4	C_2H_6	Oil Tar	C
		°C.	*hours*		*per cent*						
1	Porcl. gl. 5 mm.	1,090	1	13.0	—	—	—	—	—	1 g. = 12% of CH_4	—
2	Porcl. gl.	1,090	2¼	20.7	—	—	—	—	—	3g.	—
3	Porcl. ungl. 4 mm.	1,040	4	6.5	14.6	—	—	—	—	1.4 g. = 8.8% of CH_4	—
4	Quartz, 3 mm.	1,130	2½	6.5	17.4	—	—	—	—	1.0 g. = 10% of CH_4	—
5	2 Quartz to 3 mm.	1,130	3⅛	12.9	21.0	3.2	31.5	59.5	0.0	3.4 g. = 12.9% of CH_4	—

To manufacture a larger quantity of light oils and tar long runs were conducted at 1,100° with a gas throughout of 60 to 70 liters per hour. After forty-eight hours none of the tubes were clogged with carbon. These runs yielded a rather watery tar and 140 to150 ccm. of light oil which were used in the following investigations.

a. Carbon. The nature of the carbon arising as a by-product is dependent on the choice of the conditions of the experiment. While in case of low gas velocity, chiefly a soot-like, voluminous, light carbon forms, in the case of high velocity, as for example in the long runs just described it is hard, and sticks tightly to the tube walls in the form of juxtaposed sheets. In experiments where the action of tin was investigated, the carbon formed peculiar threads looking like cobwebs, while in the first tests with slow gas flow (Table II, experiments 1-3), a carbon with the metallic luster described by Hofmann was produced.

b. Tar. The tar held back in the electrostatic gas purifier was brownish black, thinly liquid, lighter than water, smelled distinctly like naphthalene and contained, depending upon the conditions of the experiment, more or less free carbon. When a sample was distilled, it began to boil at about 200°. The distillate (14 per cent.) which passed over up to 250°, solidified completely. It consisted chiefly of naphthalene. Of the fraction 250° to 360° (29 per cent.), 90 per cent. consisted of a yellow brown, green fluorescent oil; the rest consisted of solid, cyclic hydrocarbons from which anthracene was isolated. The distillation residue was a pitchy substance.

c. Light Oil. As mentioned at the beginning the light oils were recovered by means of activated carbon. After driving them off with superheated steam, we obtained an oil of the following properties:

Density at ordinary room temperature: $d_4^{25.5}=0.8724$
Refraction index: $n_d^{25.3}=1.50088$
Elementary analysis: 91.72 per cent. C and 7.68 per cent. H_2, or
91.72 per cent. C and 7.71 per cent. H_2
Iodine number after Wijs: 58.4 (57.8),
Distillation analysis after Engler and Ubbelohde:
Initial boiling point, 59°:

To °C.	70	80	90	100	110	120	130	140
Volume per cent.	3.3	15	48	66	77	79	80	82

To °C.	150	160	170	180	190	200
Volume per cent.	83	85	86	87	87	90

A fractional distillation with a column having porcelain rings filled to a height of 30 cm. resulted as follows:

	Fraction	Weight
		Per Cent
1	Up to 55°C.	7.8
2	55-85°	61.1
3	85-115°	12.6
4	115-145°	3.9
5	Over 145°	14.6

Apparently the first fraction consists chiefly of unsaturated combinations. They add bromine and react with mercuric acetate solution.

The second fraction, which was by far the largest, consisted chiefly of benzene. Upon repeated fractionation 81 per cent. passed over between 79° and 81°. The physical constants of this part were determined.

$$D_4^{20}=0.8750; \quad nD^{20}=1.49890$$

The corresponding values for benzene are:

$$D_4^{20}=0.8736; \quad nD^{20}=0.50154$$

Upon nitrating a small quantity, m-dinitro-benzene was obtained amounting to 82 per cent. of the theoretical.

The parts boiling above the benzene fraction, as we have already mentioned, decrease in quantity. On the basis of the results obtained from further fractionation, the toluene fraction constitutes approximately eight per cent. of the total light oil, while the xylene fraction amounts to nine per cent. and the naphthalene to 10 per cent. For the detection of toluene, a part was nitrated and 2.4-dinitro-toluene of melting point 70° was obtained with a yield of 74 per cent.

d. Gas. As the composition of the final gases we can refer you to the analyses given in the tables. Among the unsaturated hydrocarbons whose nature we have not yet determined separately, we found acetylene, which was identified by means of the copper compound.

The above described experiments have confirmed the supposition that for the production of higher hydrocarbons by way of the thermal decomposition of methane, the duration of the heating is of just as great an importance as the temperature. If the duration of heating exceeds sixty seconds, there is usually time enough to separate all the hydrogen from the methane molecule. The methane decomposes, then, according to the well known equation.

$$CH_4 = C + 2H_2$$

As far as the temperature is concerned, we observed in the porcelain tubes below 900°C., without the use of catalyzers no remarkable decomposition of methane even at low velocity. A temperature of 1,200° in case of all the velocities (up to 70 liters per hour) investigated by us, was too high for the purposes in mind. Above this temperature there was always an abundant separation of carbon which clogged the tube in a short time. This observation, however, is true only for pure methane. The more it is diluted by inert gases during the reaction, the higher the temperature that must be chosen. Moreover, the influence of the temperature is not a simple matter. There is, certainly, an optimum temperature for the splitting up of the methane and another for the combination of the fragments. Coming to the discussion of the duration of heating, there is, certainly, in an analogous manner, also a most favorable period of heating for a definite temperature of cleavage and a most favorable period of heating for that temperature at which the fragments are to unite to form higher hydrocarbons. The nature of the resulting products will depend upon the radicals to

which the methane molecule is decomposed by hydrogen cleavage, and upon what conditions the radicals can combine, so that the total process is surely very complicated, although it may seem to be simply conducted by passing methane through a red hot porcelain tube. But these various factors influenced to a great extent the nature of the products and their relative amounts. To give an example let us mention that in experiment five, which was conducted with methane from aluminum carbide (the methane was only 83 per cent. pure, since it still contained hydrogen and nitrogen); there was used a porcelain tube five mm. in diameter, which was heated for a distance of about 10 cm., and the gas passed through at the rate of 24 liters per hour; here the heating period of the gas amounted to somewhat less than one-third second. If this heating period be compared with those that were used by Bone and Coward (Table I), it will be seen that in that case the shortest periods were still one hundred and eighty times as long as those used by us, and it can be understood why with them the methane had time to decompose almost entirely into carbon and hydrogen.

If the temperature is carried higher, then the period of heating can be shortened, but the nature of the products will be changed thereby, and the danger of carbon separation becomes greater. Concerning the influence of the velocity of cooling or of the cooling of the escaping gases, we have not experimented as yet.

Concerning the role of pressure, we can predict with considerably certainty that it is disadvantageous for the methane cleavage itself, but that it will be advantageous for the polymerization of the resulting products. Thus it could be imagined that the best method of going, for example, from methane to benzene, is that the cleavage be carried out under low pressure, and that the further treatment of the gas take place under pressure.

Let us refer, by way of example, to experiment five of Table IV in discussing the yields obtained by us. This experiment has been especially mentioned already in connection with the period of heating. It was carried out with methane prepared from aluminum carbide. The gas contained 83 per cent. methane, 9.2 per cent. hydrogen, and the rest was nitrogen. Altogether 108 liters of gas were passed through a porcelain tube with an inner diameter of five mm. in four and one-half hours. In this amount are contained 90 liters of pure methane. There were received 5.7 grams of light oils, 1.1 grams of tar, and 3.5 liters of unsaturated hydrocarbons, which calculated as ethylene, weigh 3.7 grams. If these numbers holding good for 90 liters of pure methane are referred to one cbm., then we have per cbm. 63 grams of light oils, 12 grams of tar, and 41 grams of ethylene, making a total of 116 grams of higher hydrocarbons. These yields according to our opinion will be considerably improved, which is evident from the fact that of the methane employed only a slight amount was consumed. In the gas employed were 90 liters of pure methane. The quantity of the final gas due to expansion amounted to 118 liters, with a methane content of 61.8 per cent.; the remaining methane amounted, accordingly, to 73 liters. Thus 17 liters of methane—12 grams were used up. If we compare with this weight the sum of the products obtained, namely: $5.7+1.1+3.7=10.5$ grams, then there is a sufficient agreement if we consider the hydrogen cleavage, for the 25 liters of hydrogen which were formed by cleavage, represent a weight of about two grams. We see from this that no noteworthy amounts of carbon could have separated under these conditions.

That at least half of the light oil consists of benzene, has already been shown in the experimental part. Apparently also the other liquid hydrocarbons are chiefly of an aromatic nature, so that it is not impossible when the conditions are favorable, to resort to methane in benzene synthesis. For example, this may be the case in many countries, where there is no sufficient use for the natural gas present, where so far, on account of the lack of a better use, the so-called carbon black is wastefully manufactured with a yield of only two per cent. If the yields were successfully improved, then methane could be considered in the manufacture of benzene, also in the case, where it is produced in the manufacture of a nitrogen-hydrogen mixture suitable for ammonium synthesis, by the fractionating of coke oven gas according to the Linde process, and where it has no other use except to add it to other illuminating gas.

TABLE IV

Number	Tube, Inside Diameter	Gas Before The Experiment. Name	Heavy H. C.	H_2	CH_4	C_2H_6	Temperature	Time	Liters Per Hour	Exp.	Gas After Experiment				Oil	Tar	C
											Heavy H. C.	H_2	CH_4	C_2H_6			
							°C.	hours		per cent							
1	Double tube	Concordia	1.8	0.0	93.0	0.0	1,000	6	68	6.5	2.4	14.4	78.2	0.0	6 cc.	3 g.	1 g.
2	Porcl. 5 mm.	Concordia washed with fuming H_2SO_4	0.6	0.0	93.8	0.0	1,100	—	6.5	21	2.6	21.8	71.8	0.0	—	—	—
3	Double tube	Neuengamme	0.3	0.2	89.0	0.0	1,085	5½	63	6	1.3	11.4	76.6	—	7 g.	3 g.	0.2g
4	Porcl. 14 mm.	CH_4 prepared from Al_4C_3	0.0	0.0	91.6	0.0	1,110	3	60	—	—	—	—	—	3 g.	0.5g	—
5	Porcl. 5 mm.	CH_4 prepared from Al_4C_3	0.0	9.2	83.0	0.0	1,190	4½	24	About 8	3.0	29.8	61.8	0.0	5.7 g.	1.1 g.	Very little
6	Double tube	Fermentation methane	0.5	0.0	91.3	0.0	1,110	6	63	About 6	1.5	11.0	82.2	0.0	5 g.	2 g.	Little
7	Porcl. 5.5 mm.	CH_4 from illum. water gas mixture after Sabatier	0.0	4.0	67.7	0.0	1,150	—	30	4.5	—	—	—	—	—	—	—
8	2 Quartz to 3 mm.	Gas by mixture of H_2 and CH_4	0.7	66.7	26.7	0.0	1,200	2⅛	12.9	—	2.4	72.2	14.3	0.0	0.7 g.	0.7 g.	—
9	2 Quartz to 3 mm.	Reaction gas Tab. III, ex. 5	3.2	31.5	59.5	0.0	1,190	—	12.9	24.6	1.5	54.7	34.0	0.0	—	—	—

The Sodium Phosphate Position

Its Imports, Value and Movement Since 1921

WITH the temporary lull in the investigation of the Tariff Commission and the completion of arrangements by which a new factor will handle imported material, consumers of di-and trisodium phosphate have begun to wonder what the future holds for them in this market. In its preliminary statement on the cost-of-production investigation the Tariff Commission states that a comparison of domestic and foreign costs indicates that there is a difference of more than ¾ cent per pound. As the existing duty is only ½ cent per pound, a fifty per cent. increase in tariff seems inevitable, barring unforeseen developments in the hearings which remain to be held. What effect will this have upon the market and prices?

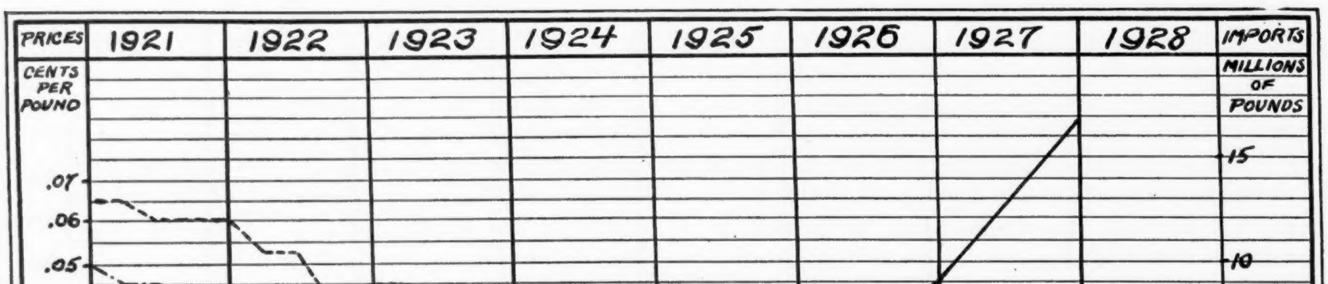
Imports of sodium phosphate have increased tremendously since 1920. From that time through 1924 the increase was gradual from 1,274,938 pounds, valued at $33,464 in 1921 to 1,818,222 pounds, valued at $45,028 in 1924. In 1925, however, imports amounted to more than double the quantity imported in the previous year, reaching a total of 4,500,220 pounds, valued at $101,908. But that figure was dwarfed by the 9,055,458 pounds, valued at $227,932, imported in 1926, and the 16,770,555 pounds, valued at $395,402 imported in 1927.

Domestic production has also increased apace due to the increased consumption of disodium phosphate by the silk industry and to the growing use of trisodium phosphate as a cleaning agent. In 1921, production amounted to 56,428,000 pounds valued at $3,052,952 and this has gradually increased to an output of 158,688,000 pounds in 1925, valued at $5,758,488, and to 165,000,000 pounds in 1926, valued at $5,682,950.

Apparent consumption has also increased during this period from about 57,703,000 pounds in 1921 to 163,188,000 pounds in 1925 and 171,749,710 pounds in 1926. From these figures it may be seen that while domestic production has increased at about the same rate as consumption, imports have increased all out of proportion. Thus we see imports supplying 2.3 per cent. of consumption in 1921 and 1923; 2.8. per cent. in 1925 and 5.2 per cent. in 1926.

While the imports in 1927 show a large increase over 1926 and production figures are not as yet available, it is evident that domestic manufacturers supply more than 90 per cent. of the annual consumption of sodium phosphate and that imported material alone could not begin to supply the demands of the domestic market.

These imports, it must be noted, are for the combined salts of sodium phosphate. The percentage of consumption supplied by di-salt was much larger, and that supplied by tri-salt much smaller, than these percentages indicate. Invoice data obtained by the Tariff Commission showed that 7,716,092 pounds of disodium phosphate, and 1,180,540 pounds of trisodium phosphate were imported in 1926. Allowing for small quantities exported in 1926, the proportion of consumption of the di-salt supplied by imports during that year was 12.5 per cent. and of the tri-salt one per cent. These percentages are based upon a production during 1926 of 54,286,434 pounds of the



The imports per million pounds of both tri-sodium and di-sodium phosphate are indicated by the solid black line; price of tri-sodium phosphate by dashes and di-sodium phosphate by dots and dashes.

di-salt valued at $1,784,862, and a production of 110,785,226 pounds, valued at $3,897,988, of the tri-salt.

While the price tendency of both salts in the domestic market has been downward since 1921, the last few years have found quoted prices being maintained at an unchanging level of $3.90 pound for tri-sodium phosphate and $3.25 pound for di-sodium phosphate in carload lots at New York. But this apparent steadiness has been upon the surface only. In reality, the market has been most unstable due to the struggle between domestic producers and importers. With cost advantage of over 3/4 cent per pound, as brought out by the investigation of the Tariff Commission, the importers have had sufficient margin to cut prices when necessary to get the business. According to the figures of the Tariff Commission, the sellers of imported material had over 1/4 cent per pound advantage in this price war representing the difference between the existing tariff and the lower foreign costs of production. Price cutting has been prevalent, with the domestic producer logically unable to meet imported prices, but often doing so, and taking a loss, in order to get the business.

Duty Rate to be Probed

If the tariff is raised, as the preliminary survey would seem to indicate, and costs are more nearly equalized, the outlook is for a stable market at present price levels. The agency for the imported material is being transferred to another factor and that should aid materially in clearing up the situation. A probable increase in the existing tariff holds in it no threat of higher prices to the consumer, but merely a return to a more stable basis which, with price-cutting eliminated, will enable him better to estimate his own costs and assure him that no sudden drop in price will leave him at a disadvantage with his competitors.

In view of the recent statement of Lord Melchett, of the Imperial Chemical Industries, Ltd., that the production of synthetic rubber is not being planned by the British chemical combine, it is of interest that the I. G. Farbenindustrie, reported some time ago as conducting experiments with an artificial rubber product, now apparently has brought its research to a stage where the practical use of this synthetic product is being made the subject of further experiments, reports the "Daily News Record."

Sundry commodities which are usually made of rubber have been submitted to public corporations and research specialists to test, in a commercial way, the possibilities of these articles as made from I. G. synthetic rubber, and at the Nuerburg Ring, Germany's famous automobile race track near Cologne, two cars are now running day and night shod with tires made of the artificial I. G. rubber. So far, they are giving satisfactory results, in some respects, it is said, even better results than real rubber in that they hold the air longer, and are as resilient as real rubber.

There is no intention on the part of the German chemical combine to market this artificial product for the moment, because it is felt that its properties should be tested to capacity so as to place a material in the market which, both in property and price, will furnish its own reason why it should supplant real rubber, despite the feeling of Lord Melchett, not shared in Germany, that real rubber is cheap enough and supply plentiful.

New Incorporations

Marvel Bleach & Chemical Co. Inc., manufacture bleach, water softeners, etc. $10,000. Louis Epstein, 252 E. 51st St., Brooklyn; Rose Epstein, 252 East 51st St., Brooklyn; Sam Silverman, 1659 Washington Avenue, Bronx; Esther Gruesetz, 111 Van Buren St., Brooklyn, N. Y.

Mississippi Natural Gas Corp., Wilmington, Del. $350,000. Corporation Trust Co. of America, Wilmington, Del.

Super-Plastic Silicates, New York, chemicals. 2,000 shs com. E. A. Meyer, 217 Broadway, New York.

Chemical Chimnee Sweep Co., Newark, N. J., chemists. $50,000. Egner and Beatty, Newark, N. J.

Marvel Bleach and Chemical Co., New York. $10,000. E. Grusetz, 111 Van Buren St., New York.

William Chemical & Blending Corp., New York. $10,000. Schoenfeld & Rosenberg, 1440 Broadway, New York.

Denton Products, New York, chemicals, etc. 64,500 pf. 2,000 shs com M. Moss, 177 Montague St., Brooklyn, N. Y.

Wexler & Blumenthal, New York, paints. $10,000. M. K. Bauer, 1440 Broadway, New York.

Oxiton Products Co., New York, chemicals. 1,000 shs com. United States Corp. Co., 150 Broadway, New York.

Moha Chemical, New York. $10,000. C. Firestone, 150 Broadway, New York.

R. Forbes Co. Ltd., Hespeler, Ont., Canada, textiles. $50,000. Francis G. Bush, Herbert W. Jackson, Clifford G. Meek.

Curtin-Howe Corporation, Ltd., Montreal, Quebec, Canada, chemicals. 500 npv. George C. Horwood, Alfred G. Mueller, Harold C. Hobart.

Bowman Chemical Corp., New York. $1,000. M. Kirsch, 7 W. 45 St., New York.

Chemical Industries Corp., Wilmington, Del., stocks, bonds. 250,000 shs com. Corporation Trust Co. of America, Wilmington, Del.

Electric Synthetics Co., Jersey City, N. J., chemicals. $30,000. Joseph F. Cotter, New York.

Allied Tar & Chemical Corp., Binghamton, N. Y., coal tar. 300,000 shs com. Corp. Trust Co. of America.

Pa-Var Mfg. Co., New York, paints, enamels. 300 shs com. T. L. Green, 233 Broadway, New York.

Olympic Laboratories, Bronx, chemicals. $10,000. Jacobskind & Joffe, 151 W 40th St., New York.

Laemmle Laboratories, Brooklyn, N. Y., chemical engineering. $100,000. Tausch, Hamilton & Herrlich, 475 Fifth Ave., New York.

Oxidation Products Co., Inc., Wilmington, Del., chemicals, drugs. 10,000 shs com. Corporation Trust Co. of America, Wilmington, Del.

American Crystal Corp., Wilmington, Del., chemicals. $100,000. Corp. Trust Co. of America, Wilmington, Del.

The Charbox Co., Wilmington, Del., drugs, chemicals. 600,000 shs com. Corporation Trust Co. of America, Wilmington, Del.

Sanative Products, Inc., Wilmington, Del., drugs, chemicals, 1,000 shs com. Corporation Trust Co. of America, Wilmington, Del.

Oxford Piece Dye Works, Inc., Oxford. $125,000. Aubrey, Steckel & Senger, Allentown, Pa.

Starr Etta Products Co., New York, chemicals, medicines. 200 shs com. Goodhue, Morrison & Lynn, 140 Nassau St., New York.

Atlantic Celluloid Waste Co., New York, medicinal, chemical supplies. $10,000. W. P. Herskowitz, 225 Broadway, New York.

Diamond Chemical Corp., Bloomfield, N. J., chemicals. 2,500 shs com. Charles Jones, Newark, N. J.

Buxton Chemical Co., Wilmington, Del. $50,000. Franklin L. Mettler, Wilmington, Del.

Prudence Drug & Chemical Corp., New York. 250 shs com. B. Austin, 302 Broadway, New York.

National Commercial Alcohol Corp., New York, drugs. 250,000 shs com. U. S. Corp. Co.

Gilbert Chemical Corporation, Lynchburg, Va., chemicals. $50,000. Roy Gilbert, Pres., R. S. Burrus, vice-pres.; W. J. Bennett, sec.-treas.

Interstate Exploration Co., Wilmington, Del., carbon black, asphalt. 1,000 shs com. Corporation Trust Co. of America, Wilmington, Del.

Artum Chemical Mfg. Co. of Baltimore, Wilmington, Del., chemicals, drugs. $500,000. American Guarantee and Trust Co.

P. K. Mills Ltd., Hamilton, Ont., textiles. $50,000. Sydney E. Wedd. Bruce V. McCrimmon, Genevieve Ozburn.

Dewey and Almy Chemical Company of Canada, Ltd., Farnham, Quebec. $40,000. Alexandre Chase-Casgrain, Errol M. McDougall, Frances Callahan.

It is proposed to form a new Belgian company, capitalized at 30,000,000 francs for the purpose of recovering by-products from roasting sphalerite or blende. The principal product thus to be obtained is sulfuric acid. The site of the new factory will be Willebroek.

Several companies are concerned in this new undertaking, the best known being Produits Chimiques de Laeken, Metallurgique de Prayon, Societe Metallurgique de Boom, Societe Anonyme de Rothem, Cie. dec Metaux d'Overpelt-Lommel et de Corphalie. It is possible that the Societe des Mines et Fonderies de Zinc et de Plomb de la Nouvell-Montagne will also have a share in the venture.

An Economic Discussion of

The Nitrogen Situation

With Regard to its Future Development

By Dr. Firman E. Bear

Head of Soils Dept., Ohio State University

IN 1798, The Rev. Thomas R. Malthus, an English political economist, published his "Essay on the Principle of Population". The effect of this, in Europe, was the arousing of the widespread fear that the constantly growing numbers of people would soon overtake the food supply. Malthus's only promise of relief was thru famine, pestilence, and moral restraint.

The temporary answer to this problem was soon found in the rapid growth of the agriculture of the New World; the invention of better farming machinery; the improvement of transportation facilities; and the development of the fertilizer industry suggested by Justus von Liebig of Germany and started by Sir John Lawes of Rothamated fame. In fact, the situation was eventually so improved that much of the cultivated land of Europe, particularly in England, was of necessity turned back to grass.

A century later, 1898, Sir William Crookes, an English chemist, in his presidential address before the British Association for the Advancement of Science, again raised the question as to the permanency of an adequate food supply by calling attention to the rapid exhaustion of the Chilean nitrate deposits, the source of the most important constituent in European wheat fertilizers.

Crooks answered his own question by presenting proofs of our capacity to make nitrate from the nitrogen of the air and thus to provide an inexhaustible supply of this material for fertilizer purposes. As a result, the air-nitrogen industry gradually came into existence. Subsequently the World War forced its rapid development. With the signing of the Treaty of Versailles, vastly increased quantities of nitrogen materials became available for agricultural use.

It was just thirty years ago that Sir William Crookes sounded the warning of the diminishing nitrate supply. So rapid has the development of the nitrogen from air industry been in this comparatively short span of years, that F. C. Speyer expresses the fear that if all available nitrogen is used, an overproduction of foodstuffs will result.

In 1928, only 30 years after Crookes had suggested the possibilities of an air-nitrogen industry, F. C. Speyer, an English industrialist associated with that industry, expressed the fear that so much nitrogen would soon be available for fertilizer purposes, that, if all of it is used, an overproduction of food will result with serious economic effects both on the nitrogen industry and on agriculture.

Speaking before the Second International Nitrogen Conference on the Adriatic Sea, Speyer placed the world production of nitrogen by the year 1930-31 at 2,332,000 metric tons of the element. Dr. Julius Bueb, head of the Stickstoff Syndikat of Berlin, addressing the same conference, placed the world's consumption of nitrogen for the year 1926-27 at 1,339,000 metric tons of the element. This would indicate that the farmers of the world will be asked to increase their annual consumption of fertilizer nitrogen by one million tons within a period of four years.

What can be done with a million metric tons of nitrogen? (This is equivalent to nearly five million tons of sulfate of ammonia or 6½ million tons of nitrate of soda.) The German nitrogen interests claim that, for Central Europe, a pound of nitrogen, rightly used, will produce 150 pounds of sugar beets 100 pounds of potatoes, 45 pounds of hay, 20 pounds of grain, or enough grass to yield 20 pounds of milk.

Assuming the correctness of these figures and that the entire one million tons of nitrogen was used on the wheat crop, the world would have 750 million extra bushels of wheat annually at its disposal by the year 1930-31. This is nearly 95 per cent. of

the average total production of wheat in the entire United States.

This country is looked upon by the air-nitrogen, the Chilean nitrate and the by-product sulfate of ammonia interests as a fertile field for the sowing of propaganda favoring the use of much larger quantities of nitrogen fertilizers. It would seem that no other country has such immediate possibilities for the development of its agriculture as has the United States. We have vast acreages of good land from which the virgin fertility is now practically exhausted; intelligent farmers, powerful enough to command legislative consideration; highly efficient machinery for plowing, seeding, cultivating and harvesting; the best organized system of agricultural research, teaching and extension that the world has ever known; and an enormous fertilizer industry that is prepared to compound the proper formulas and to supply the demand as rapidly as it is created.

Increased Consumption Inevitable

There is no question but that our consumption of nitrogen will ultimately be enormously increased. As to how rapidly this increase will take place is a matter concerning which there is considerable doubt. W. D. Landis, vice-president of the American Cyanamid Company, speaking on this subject at the Economic Symposium on Nitrogen held under the auspices of the American Chemical Society at Swampscott in September, 1928, expressed the view that no very rapid growth in the use of nitrogen in this country is to be expected. He pointed out this significant fact that when Europe doubles its nitrogen consumption it simply imports less food while, if we double ours, we produce a greater surplus at lower prices.

Nevertheless, one cannot ignore the facts that increasingly heavy investments are being made in the advertising and demonstration of nitrogen materials by the several competing syndicates; that many of these demonstrations have shown rather phenomenal increases in yield; that farmers of the vast Grain Belt are finding it necessary to use some nitrogen to maintain yields and more nitrogen if yields are to be increased; that the substitution of the automobile and the tractor for the horse, and the use of farm wastes for the production of wood substitutes and clothing, tend to make the need for nitrogen more imperative; that the price of nitrogen is falling and has already reached a point where it offers attractive possibilities for profit; that lower-priced nitrogen makes it necessary to reconsider the question as to whether legumes are the cheapest source of all the nitrogen required on the farm; and that the answer to surpluses may be found in the more efficient farming of the better land with the return of still more of the marginal land to pasture, woodland and waste.

What can be done with cheaper nitrogen in the United States? The increases claimed for nitrogen in Germany are of great interest to us. Speaking before the International Nitrogen Conference, H. J. Page, chemist for Nitram, Ltd., London, reported concerning a series of experiments with nitrogen fertilizers on English pasturelands. Some idea of the possible significance of these tests to practice may be gained from the fact that, in one case, an acre of pasture, treated with approximately 100 pounds of nitrogen, in addition to carriers of phosphoric acid, potash and lime, was made to produce 710 gallons of milk and, in another, 756 pounds of beef in one season. T. H. J. Carroll of the same company, in conversation, stated that, in his opinion, the discovery of the "New System of Pasture Management," of which very heavy applications of nitrogen fertilizers is a part, is the most important discovery as relates to English agriculture that has been made in the last 50 years.

The indications are that grass may be almost 100 per cent. efficient in transforming nitrogen into protein. The cost of a pound of protein, therefore, need not exceed 6¼ times the cost of a pound of nitrogen applied to the pasture; in fact, the cost of the protein is normally considerably less than this, if one credits the extra starch equivalent produced, as a result of the use of the nitrogen, as its market value. Grass pastured closely and by a scheme of rotation originating in the work of Dr. Hermann Warmbold, in Germany, can, if liberally treated with nitrogen fertilizer, be made to have a composition closely resembling that of linseed meal. The length of the pasture season can also be considerably increased by this system of management.

In translating these and similar European experiences and data into terms of American agriculture, one has to keep in mind certain differences in the climate and in the type and intensity of the farming of the two regions. Perhaps it is safer to ignore foreign investigations entirely and to proceed to examine into the evidence, as to the usefulness of nitrogen fertilizers, that has been accumulated in this country.

Efficiency Has Been Proven

So well have the necessity and profitableness of nitrogen fertilizers been demonstrated in the case of our intensively cultivated crops in this country that little consideration need be given them in this discussion. In general, the better farmers have found it profitable to apply from 20 to 30 pounds of nitrogen per acre on tree fruits, grapes and small fruits; from 25 to 40 pounds per acre on cotton; from 30 to 50 pounds per acre on tobacco and sugar beets; and from 50 to 100 pounds per acre on potatoes, truck crops and sugar cane. A very large proportion of the 250,000 tons of nitrogen consumed annually in the United States is applied to these crops.

Usually an investment in advertising and sales effort for any material pays its highest dividends in a territory already accustomed to the use of that material. It is to be expected, therefore, that the first marked increases in the consumption of nitrogen will be in those regions where the above crops are being grown. The high acre values of these crops also favor

this assumption since these offer a chance for considerably increased profit from the use of more pounds of cheaper nitrogen, provided always that no undue surpluses of these crops result.

For the moment, however, the greatest interest attaches to the possibilities in the use of nitrogen throughout the great grain and pasture areas. What can be done with cheaper nitrogen on corn, on wheat, and on grass?

Experiments in the Corn Belt

Before proceeding to a consideration of the evidence on this point, it may be well to call attention to the fact that the agronomists of our Grain Belt, under the leadership of such noted workers as Cyril G. Hopkins and Chas. E. Thorne, have generally assumed that the nitrogen requirements of the crops of that region would be met, almost entirely, by the frequent growing of legumes in the rotation. The experimental procedure has been influenced by this point of view. The result is that to-day when our soils are about depleted of their original store of available nitrogen, when the intensity of our agriculture must be increased, and when a great variety of excellent carriers of nitrogen are placed at our disposal at attractive prices, we are far removed from knowing not only what can be done with nitrogen fertilizers but how to proceed in their use in order to get the most out of them.

If one examines into the climate of that portion of the United States lying east of the Rocky Mountains, he finds a fan-shaped area beginning at about Pittsburgh, Pennsylvania, and spreading out to the west, entering Canada at the northwestern point of Minnesota and entering Texas at the southwestern point of Arkansas, which is subject to the most serious summer drouths. North of this fan-shaped area and extending on to the Atlantic Coast is a region of relatively cool, moist climate, especially adapted to such crops as oats, potatoes, and grass. This is a region in which marked response to nitrogen fertilizers can be expected. It is the climatic region of the United States that most nearly corresponds to that of Central Europe where such high acre yields of these crops are produced and applications of nitrogen fertilizers are profitable. South of this fan-shaped area is a region of relatively hot, moist climate where, by reason of excessive oxidation of the soil organic matter and the leaching of heavy rains, the lack of nitrogen is a seriously limiting factor in the production of satisfactory crop yields and nitrogen fertilizers are again very effective. This is the region in which cotton, tobacco, sugar cane, and winter-grown truck crops abound. The fan-shaped area itself, the Corn and Wheat Belt of the United States, is one of which we are at present uncertain, concerning the profitableness of nitrogen fertilizers.

While we have not always been successful in securing such worth while increases in yield of the grain crops by the use of nitrogen fertilizers, yet we are convinced that, if the conditions of the test are such as to give the nitrogen a fair chance, considerable increases can be produced. This opinion is based not only upon our own investigations but upon results secured in numerous field demonstrations carried on by the Chilean nitrate and the Arcadian sulfate of ammonia agencies and checked by our own specialists.

When one remembers that the average yield of corn on the nine million acres of fertile land devoted to that crop in the great State of Illinois is only 36 bushels, it is not difficult to see that to make farming profitable on the average farm in that State something must be done to boost these yields. Limestone and sweet clover have been shown to work wonders in this connection and wherever this scheme is feasible it merits adoption. But it is conceivable that considerable might be done by substituting air-nitrogen from the fertilizer factory for the air-nitrogen of the legume crop wherever, for any reason, the latter has not had a chance to make its contribution to the soil.

Research Problem is Known

The research problem at hand is primarily one of determining when the nitrogen should be applied under our climatic conditions. The evidence indicates that, if considerable amounts of nitrogen are to be used, only a part of it should be applied at the time of planting the crop (at least in the case of the cereals) and that the remainder should be added at some later stage in its growth, the exact time for which has not as yet been determined. If too much nitrogen is used at seeding time, a restricted root system and excessive vegetative growth are the result. If the time of the second application of nitrogen is too long delayed, it goes to increase the protein content rather than the yield of grain. In the case of hard wheats, both are desirable.

There is serious need of a systematic study of nitrogen fertilizers in relation to drouth. Grass liberally and frequently treated with nitrogen remains green and continues to grow in spite of dry weather. Wheat and corn, well supplied with nitrogen, do not fire in dry seasons. It seems probable that bacterial action, necessary for the liberation of the nitrogen of the soil organic matter, ceases by reason of the dryness of the surface soil long before the roots of plants, liberally supplied with phosphate and potash fertilizers, have exhausted the supply of available water in the subsoil. Except as nitrogen in inorganic forms is available to the plant during such periods of its growth, nitrogen starvation of the above-ground portions of the plant takes place.

These and other problems relating to the better use of nitrogen will no doubt receive due consideration on the part of our research workers, stimulated by the producers of nitrogen materials. The pendulum may ultimately even swing to the point of overdoing the use of nitrogen just as has been the case in local areas with landplaster, lime and superphosphate at various periods in our agricultural history. It would seem, however, that there need be no fear of such a result in

any immediate future, considering the fact that our present consumption of nitrogen in the United States averages less than one pound of the element for every acre of improved land.

The operation of the Malthusian law has been indefinitely set aside by the air-nitrogen industry. In this country we look forward confident of our ability to feed an extra million more people every year for many years to come. To this end the consumption of nitrogen fertilizers will of necessity steadily increase. The intensification of our agriculture and the breeding of new races of plants capable of using more nitrogen and producing much higher yields under our climatic conditions will guarantee the continued growth in consumption of this element. As to how much the tonnage may be by 1930 or 1950 or even by the year 2000 is difficult to estimate. Readjustments in the agriculture of the entire world are involved. Of this we are sure, however, that no matter how rapidly the demand for nitrogen may grow, the supply will always be adequate to meet our needs.

Foreign Trade Opportunities

Compounds (protective coatings), for automobiles; and compounds to prevent leakage.	†34387	Heidelberg, Germany	Purchase.
Copper carbonate	†34482	Winnipeg, Canada	Either
Disinfectant salts and crystals, liquid insecticides, and floor cleaning powder.	†34444	Montreal, Canada	Purchase.
Galalith in bulk	*34451	Rio de Janeiro, Brazil	Agency.
Naval stores	*34390	Cardiff, Wales	Do.
Oils, essential	*34389	Dresden, Germany	Do.
Paints and oils	*34357	Maceio, Brazil	Do.
Photographic chemicals	*34462	Weltevreden, Java	Both.
Rosin	*34388	Bucharest, Rumania	Agency.
Bakelite and condensation products.	*34232	Osaka, Japan	Do.
Bedbug powder	*34233	Amoy, China	Do.
Carbide of calcium	†34247	Buenos Aires, Argentina.	Agency.
Carbon black, pressed	*34241	Antwerp, Belgium	Do.
Celluloid, translucent, white, for lamp shades.	†34224	Mexico City, Mexico	Purchase.
Chemicals	*34284	Bangkok, Siam	Do.
Cow's sinews	*34233	Amoy, China	Do.
Disinfecting fluids	*34235	Saigon, Indo-China	Both.
Dyes and chemicals	†34237	Bombay, India	Agency.
Extracts, bottlers'	†34243	Vancouver, Canada	Do.
Fertilizers, chemical	*34236	Palermo, Italy	Do.
Paints and varnishes	*34240	Liverpool, England	Do.
Pitch, stearin, cottonseed oil and bone (pitch).	†34234	Hamburg, Germany	Purchase.
Rosin	†34247	Buenos Aires, Argentina.	Agency.
Do	*34265	Pernambuco, Brazil	Do.
Soap-manufacturing materials, raw.	*34269	Palermo, Italy	Do.
Carbon black	*34527	Alicante, Spain	Purchase.
Chemicals	*34613	Lisbon, Portugal	Agency.
Chemicals, industrial	†34520	Karachi, India	Both.
Do	*34522	Resario, Argentina	Agency.
Colors, ultramarine	†34526	Ravensburg, Germany	Do.
Explosives	*34548	Constantinople, Turkey.	Do.
Glue, commercial	†34529	Ottawa, Canada	Do.
Insecticides and fungicides	†34524	Hamburg, Germany	Do.
Oil, wood	†34523	do	Do.
Oils, technical (linseed, etc.)	†34525	Alexandria, Egypt	Do.
Polishes, furniture and metal	†34577	Montreal, Canada	Purchase.
Rosin	†34523	Hamburg, Germany	Agency.
Rosin and turpentine	*34521	Dresden, Germany	Purchase.
Saltpeter, Chile	*34506	Amberg, Germany	Do.
Shellac and varnish gums	*34527	Alicante, Spain	Do.
Caustic soda, and other chemical products.	*34758	Ceara, Brazil	Agency.
Creolin and other disinfectants.	†34647	Winnipeg, Canada	Both.
Dental supplies	*34746	Sydney, Australia	Sole agency.
Lacquers for automobiles.	†34653	Wellington, New Zealand.	Agency.
Lacquers, varnishes, and enamels.	†34660	Prague, Czechoslovakia	Do.
Oil, linseed	†34760	Havana, Cuba	Do.
Oils, essential	†34649	Santiago, Chile	Do.
Rosin	*34758	Ceara, Brazil	Do.
Soda ash, caustic soda, silicate of soda, and sulphate of ammonia.	*34629	Swatow, China	Both.

Who's Who In Chemical Industry

Alsop, Fred E., manager chemical and alkali department, Maillard & Schmiedell. Born, Salinas, Calif., 17, July 1893; mar., Hazel C. Johnston, Ogden, Utah, 12 May 1917. Memb., Natl. Assn. Practical Refrig. Engrs., Paint, Oil & Varnish Club. Hobbies: hunting, fishing, golf. Address: Maillard & Schmiedell, 701 Board of Trade Bldg., Portland, Ore.

Christopher, Forrest Tilden, superintendent, East Works, Grasselli Chemical Co. Born, Jamestown, Ohio, 24 Dec. 1881; mar., Clara Mildred Shaw (deceased), Cleveland, Ohio., 15 May; children, 2 daus.; educat., Case Schl. App. Sci., Cleveland, O., 1904. American Radiator Co., Buffalo, N. Y., chem., 1904-05; Grasselli Chem. Co., chem. Cleveland Wks. 1905-11, supt. Canton Wks., 1912-17, asst. supt. East Chicago, Indiana Wks., 1917-18, supt. E. Chicago, Ind. Wks., 1919-24, supt. East Wks. Grasselli, N. J., 1924 to date. Memb., Masonic Lodge. Hobbies: automobiles, fishing. Address: Grasselli Chemical Co., Grasselli, N. J.

Eckermann, Theodore C., president, Will & Baumer Candle Co., Inc. Born, Syracuse, N. Y., 23 Aug. 1872; educat., Syracuse High Schl. Will & Baumer Candle Co., dir. 1896; asst. treas. 1913; secy. 1915; 1st vice-pres., 1922; pres., 1925. Memb., Syracuse Chamb. Comm., Turn Verein, Liederkranz, Clubs: Syracuse Yacht & Country. Address: Spring Street, Syracuse, N. Y.

Hammond, Marvin James, secretary and assistant manager, Abner Hood Chemical Co. Born, Cambridge, Ill., 8 July 1887; mar., Corinne Hipple, Kansas City, Kans., 29 Nov. 1919; children 1 dau; educat. high schl. and bus. training. Associated with Abner Hood Chem. Co., 30 June 1903, continuously 15 June 1906. Non-commissioned Officer ub Engineer Corps during World War. Memb., Chamb. Comm., Kansas City, K. C. K.; Paint, Oil & Varnish Club, Kansas City Athletic Club and several trade organizations. Hobbies: work, history. Address: Abner Hood Chemical Co., 107-17 N. Montgall Ave., Kansas City, Mo.

Kellogg, Howard, president, Spencer Kellogg & Sons, Inc. Born, Buffalo, N. Y., 26 Mar. 1881; mar., Cyrena A. Case, Buffalo, N. Y., 27 Mar. 1906; children, 2 sons, 1 dau; educat., Pvt. Schl. Buffalo; Exeter, N. H.; Harvard Univ., A. B., 1903. Spencer Kellogg, 1903; Spencer Kellogg & Sons, Inc., gen. mgr., 1912; pres., 1922 to date. Clubs: Buffalo Athletic, Saturn, Buffalo Tennis & Squash, Saddle & Bridle, Lake Shore Hunt (Master of the Hounds). Hobbies: horses, athletics. Address: Spencer, Kellogg & Sons, Inc., 96 Delaware Ave., Buffalo, N. Y.

Pickard, Frederick W., vice-president and director, E. I. du Pont de Nemours & Co. Born, Portland, Me., 2 Sept., 1871; mar., Jane Alice Coleman, Portland, Me., 4 Oct. 1899; children, 1 son; educat., Bowdoin Coll., A. B. 1894. Portland Transcript, managing editor, 1895-1900; Oriental Powder Mills & King Mercantile Co., Cincinnati, secy., 1901-03; du Pont de Nemours, Cincinnati dist., sales mgr., 1905-07; Denver dist., sales mgr., 1908-09; Pittsburgh dist. sales mgr., 1910-18; Wilmington, Del., dir. sales, 1918-19; vice-pres. in charge sales, Wilmington, 1919-22; dir. and vice-pres., 1918 to date; gen. mgr., Dyestuffs dept., 1922-24; vice-pres. and memb. Exec. Com., 1924 to date. Du Pont Viscoloid Co., Chmn, Bd.. 1925 to date; dir. numerous Du Pont subsidiary companies. Memb., Synthetic Organic Chem. Mfrs. Assn. (Bd. Govs., 1922-24), Theta Delta Chi, Phi Beta Kappa. Clubs: Bankers (N. Y.), University (N. Y.), Lotos (N. Y.), Wilmington Country, Concord County (Wilmington, Del.), du Pont Country (Wilmington, Del.), Kedgwick Salmon Fishing (pres. New Brunswick, Can.). Hobbies: fishing, golf, stamp collecting. Address: E. I. du Pont de Nemours & Co., 10th & Market Sts., Wilmington, Del.

The Insurance Viewpoint of

Health Hazards

in the Chemical Industry

By Walter S. Paine

Research Engineer, Aetna Life Insurance Company

Headed by the knotty problem—is the question of health hazards in the chemical industry being solved?—Mr. Paine discusses many phases of chemical industrial insurance and outlines the insurance angle on five major points.

AT THE Fourth Annual National Safety Congress, held in Philadelphia in 1915, some speculative discussion arose out of the question of rejected man-power from industrial disease which it was thought would occur because of the rapid development of many of the chemical industries then flourishing in Germany but gradually being fostered by American capital in the United States. In all the discussion, no indication was found that we would be attempting to solve the problem of the health hazards in these specific industries with the patience, skill and broad viewpoint that dominates the methods now actually in force. Instead of chaos from "industrial diseases" in the chemical industry, we find the layman, chemist, physician, employer and employee co-operating, for the most part, in a sane research into ways and means of eliminating the hazards and still preserve the industrial contribution of the chemist to promote our industrial arts and supply our social and economic needs.

The health hazards in the chemical industry from the insurance viewpoint, which subject in a limited time can only be covered within specific limitations. The essential viewpoints of this subject, as we see them, are as follows:

Is the problem of "health hazards" in the chemical industry being solved? What are the essential social and economic forces producing a reduction of early discovered health hazards ? What is the attitude of insurance companies towards the "industrial disease" exposure ? Have the insurance companies a part in actually working out the remedies for these health hazards ? A few of our outstanding problems in the chemical field at the present time.

Let us first consider if the health hazards in the chemical industry are being solved. In this paper the term "chemical industry" is extended to include such industries as are, for the major part, dependent upon chemicals or chemical reactions for their final product.

It is doubtful if there is a better barometer of the trend in what is generally termed "industrial disease" cases than the records of the insurance companies. The trend towards well-lighted and ventilated buildings, together with the educational program in hygienic methods as carried out by modern industry has had its effect in reducing this hazard. Having reviewed compensation cases for a period of practically twelve years, there has been a noticeable reduction in the number of industrial disease cases, such as lead poisoning, brass ague, mercury and benzol poisoning, in industries complying with the requests to remove these hazards by providing ventilation, change in processes, a close follow-up under medical advice, and the simple rules of hygiene. Two factors make these findings doubly trustworthy:

First: We are in a far superior position to detect these health hazards today than we were twelve years ago. Furthermore, may we say that industrial medicine is now on a far more efficient basis.

Second: Industrial plants depending upon chemical operations are far more numerous as a part of our stabilized industrial life than they were in 1915, and, as a result, knowledge of the exposure and its alleviation is more widespread.

What are the essential social and economic forces producing this reduction in health hazards of a specific type ?

The interest of society at large in the human wreckage resulting in some of our industrial plants as the result of industrial progress and economic needs had its effect in calling our attention to the need of action in finding and eliminating the cause. In many cases this social interest, however, confused the problem and retarded real scientific action.

The vital force which produced results was the earnest co-operation of the chemist, physician and

industrialists interested in research to find the facts and discover corrective measures.

From the economic viewpoint, the plant managers realized that unless they corrected these health hazards, the insurance costs would be no small part of their overhead. They also realized that production would decrease because of labor turnover, increased labor costs, spoilage of material and the need of increased supervision.

Before leaving this item, may we pay our compliments to the large number of industrial officials who took a real human interest in setting up the most efficient investigation to ascertain the facts and provide remedies for existing health hazards. A large number of them not only backed this work financially but contributed liberally of their time in organizing effectively these investigations.

Industrial Disease Exposure

What is the attitude of insurance companies towards the "industrial disease" exposure ?

A number of the insurance companies are turning over every industrial disease case to their research engineer, who, after collating all available data from the field relative to the case, reviews the problem with their medical departments. In many cases the medical field adviser covers the case from the physician's viewpoint. After a complete analysis is made of collatable data, a brief is compiled and forwarded to the field inspector or direct to the plant official.

Our first obligation is always to the injured man, and corrective measures are suggested to our assured after a most careful survey and research of the case. Any investigation of this type should be carried out in co-operation with the plant chemist. No fact finding research is completed without his assistance, for he, to a large measure, has the key to the situation.

It is believed our attitude to the situation of health hazards can be endorsed by many other insurance companies, and I know of no better method of expressing these viewpoints than by the following:

Because of our membership on the Spray Painting Research Committee, we were asked to express our opinion relative to the place this innovation had in industry. Rather than making a hasty decision and passing out unwarranted, injurious propaganda against any advance in industrial arts, it has been our view that no final verdict should be given until a sane research has been made. Our answer in this case, relative to whether or not spray painting shall remain in industrial plants, prompted us to state that every new invention should be conserved for the use of mankind when it contributes to the social and economic development of the race.

Spray painting, which has already become a unit of production in most of our large industries, when rightly used, is an invention of this type. Every effort should be made to conserve this new development by making it safe for use through correct ventilation, electrical protection and the use of the least harmful paints. Spray painting, when applied according to the suggestions resulting from the research conducted by the National Safety Council Committee, should be less of a menace to the employees from the viewpoint of hazard to life and limb than many of the appliances now employed.

Safety in the use of spray painting must pass through the same process of education that is being used in industry relative to power machinery, electricity, etc. These innovations allow us to keep pace with competing industries of other nations. We are not forfeiting the use of the automobile, power machinery, or even coal mining, with their toll of human life, but we are doing everything possible to educate the individuals exposed to these hazards in the safe methods of operation.

We would find it practically impossible to eliminate these forces which mean so much to mankind, and it will always be thus with every innovation of economic and social value. We must, therefore, attack these problems by making practical researches and discovering the real facts as to their use, and then set up ways and means of making these new developments in industry conform to the safest methods of procedure.

Have the insurance companies a part in actually working out specific remedies to offset industrial health hazards ?

Aid from the Insurance Company

A "diagnosis" is essential in finding the solution of every deep-seated problem and an analysis at hand of any chemical hazard based upon actual cases often gives the starting point of such an investigation.

The insurance companies are often in a position to aid in any of these investigations because of their direct contact with cases involved. Case analyses have been furnished as a bases in former and present researches, and we are urgently advocating the increased use of such information.

The National Bureau of Casualty and Surety Underwriters financially underwrote and personally assisted in the benzol research, which incident is only one of many indications as to their willingness to aid in fathoming these problems. The interest many insurance companies have taken in researches, such as mercury poisoning, spray painting, lead poisoning, dust diseases, etc., exhibits clearly their viewpoint in relation to the health hazards when carried out in a scientific and constructive way.

From the insurance viewpoint, what are a few of the outstanding problems in health hazards, as we see them, from the chemical angle:

(a) *Benzol.* While the investigation carried out by your committee was thorough and constructive, there is till a feeling in some quarters that it is not altogether conclusive. This may be said of any piece of investigation for it is well that there are some who never feel convinced that the specific field of knowl-

edge is exhausted. A few suggestions from the field have come to us even of recent date:

1. A study of medical histories of non-fatal benzol cases.

2. Types susceptible to benzol fumes.

3. Diet of employees whose blood picture may indicate benzol poison.

As we have been closely associated with our Medical Department and our Mr. Ralph E. Prouty in a study of some 130 cases, we may at a later date be able to express a suggestion on these questions. It might be worthwhile to instruct your present committee or others to take these suggestions under advisement.

(b) *Chrome Poisoning.* With the advent of chrome plating, there has arisen another source of chrome sores which might well form a basis for a research. More than one plant has developed this hazard and the compensable cases from this cause have increased within the last few years. W are convinced that with proper ventilation, close adherence to hygienic principles and a certain amount of education among the employers and employees as to corrective measures, this exposure can be greatly reduced.

(c) *Spray Painting.* After reviewing many field reports on spray painting, one is convinced that the educational work being carried out by the N.P.P.A., DuPont's, industrial commissions, National Safety Council and insurance companies has had its effect in correcting this hazard in the larger industries. There is, however, a large field still untouched where the promiscuous large and small users of spray painting see no need of any protection either from the explosive or health hazard. It may be advisable, therefore, to appoint a committee which might place in simple form and plain English the principal hazards and methods of overcoming them.

It may be too early to make a definite statement as to the health hazard of spray painting, but our consistent review of this type of risk has failed to find a basis of alarm as portrayed in some reports on this exposure. Someone in our discussion at this meeting may have an entirely different experience.

(d) *Mercury Poisoning.* There is no doubt of the existence of mercury poison, and this exposure was called to the attention of your committee about a year ago when several industrial leaders showed a deep interest in this subject.

Here again, through the co-operation of industrialists, employees, chemists, engineers and physicians, the specific plants involved have partially eliminated this exposure through ventilation, education, medical supervision, hygiene and engineering revision. There is still room for service in this field amid industrial plants having no constructive data on this subject.

(e) *Hydrogen Sulfide Poisoning.* In the oil field and petroleum industry this exposure has, during the past year, made itself felt in our losses more from the medical costs than indemnity. The Bureau of Mines has done much to ward off the deadly results of this gas, but there is still room for constructive research. It is still too early to compile any amount of data on this subject, but as the Chemical Section is bent on safeguarding industry, this field of research may be worthy of your attention.

These are only a few of the health hazards which are now before us in this chemical age. There is till much to be done in the way of research into the dust problem from abrasives, stone dusts, etc., in an effort to reduce our number of tubercular cases. This field, however, is being developed by other departments interested in health hazards and their findings supplement our efforts in our own field.

Stronger Co-operation Asked

In closing, may we make a strong plea for a greater degree of co-operation and the most effective research possible before placing before the public any definite corrective plans. Our best in providing corrective methods in safeguarding life and limb is none too good; therefore, let us harness every possible reliable source of constructive data in solving our health hazard problem and then depend upon a broad gaged efficient committee to present for human consumption the most authentic data possible.

Heavy importation of German dyes into Japan since the recent abolition of limitations by the Japanese Government has dealt a severe blow to dye circles in Japan. Nippon Senryo Kabushiki Kaisha, Osaka, (Japan Dyestuff Mfg. Co., Ltd.), the largest producing institution of this kind in Japan under special Government subsidization, has felt this most. The annual sales of the company total about yen 5,500,000. Its products have lost ground in the home market since the withdrawal of the import limitation on German dyes last April. Its products are no longer able to compete with German articles and have dropped sharply in prices, without, however, noticeably increasing demand. It has been rumored that the company may reduce its capitalization or dissolve were circulated. Katsutaro Inahata, president of the company, admitted that the company stands in need of a business readjustment and has to produce only such dyes as will compete favorably with German dyes, or the company will not be able to carry on further business. It is reported the company has decided to reduce the capitalization next month. Its paid up capitalization is yen 8,000,000. Its stock price, yen 50 paid up, is quoted at about yen 30.

Production of soda ash in Japan this year is expected to reach a new high total, 35,000 tons, greater than in any previous year. The output for the first six months was 15,000 tons while that for the last six months is estimated at 20,000 tons. Japan is expected to yield about 55,000 tons next year with the prospective completion of new plants. The Asahi Glass Company's Fukuoka plant is expected to yield about 30,000 tons a year on its completion next year. The Japan Soda Industry Company's Tokuyama plant will have its capacity increased to 25,000 tons next year.

This year's total imports are estimated at 100,000 tons. The total supply this year, including the estimated home production of 35,000 tons, is 135,000 tons. The increase of annual demand for soda ash in Japanese manufacturing industrial circles is estimated at about 20,000 tons. In 1925 imports from England and other countries totaled 130,000 tons, while domestic production was only 12,000 tons. Last year imports dropped to about 100,000 tons while the home output increased to 25,000 tons.

The Chemical Industry

*in Relation to Civilization**

By A. Cressy Morrison
Union Carbide Company, New York City

NOT being a chemist, I am not bound by chemical formulas. My field need not be strictly limited. I can dream without losing a technical reputation. Sometimes dreams come true. Without being dogmatic about it, we may assume that this apparently stable world of ours was at one time a fragrant of the Sun itself, separating from this great source of energy at temperatures too high to permit chemical combinations. Down through eons of unrecorded time, energy was radiated into space until the most irresistible combinations took place. One can visualize these combinations in succession falling from the outer atmosphere to the regions of more intense heat, separating again, reforming and again falling.

Nature's first chemical compound seems to be titanium dioxide, followed closely by zirconium oxide, then probably cyanogen and some of the metallic carbides, and strangely enough water vapor begins early to become apparent on the cooling stars. Thus in stately procession appeared in nature's laboratories on our earth those substances with which man is most familiar.

When man first began to utilize and recombine those substances which natures chemistry had produced, he himself became a chemist. If we should erect a monument to the greatest chemical discoverer of all time we would probably have before us the image of an untutored savage who by means of temperature brought about the combination of cellulose with oxygen, releasing flaming gases which combine as carbon dioxide and water vapor. The most beautiful and useful chemical experiment ever performed was building the first fire. It was he who founded the hearth stone, the beginning of fixed habitations and it was his chemical experiment unwittingly performed that formed the basis of our civilization. This first fire was surely built over a million years ago, so man's utilization of chemical reactions is old, old indeed!

Nature herself taught us distillation and this process running its eternal cycle from ocean back to ocean brings to earth the rain and gives us water crystal pure. What queer forms of life have arisen to give us fermentation and all its derivatives. Man in utilizing natures processes soon learned to direct them and although his control was empirical what marvels he accomplished by observation, trial and error.

Until we began to discover and name the elements and hence their combinations, progress was slow indeed. But soon thereafter analytical research gave us chemical nomenclature and finally a true science. With this has come new power, new weapons of attack, and sound foundations on which to-day rests a stable chemical structure.

Out of our great schools and colleges pour thousands of young men and women highly trained in chemical lore free to exercise their intelligence and with a will and opportunity to apply their ideas for the solution of the vast problems which till exist.

Following the French Revolution and the Napoleonic era came mechanization of the world's industries. Following our Civil War came the marvelous expansion of transportation and the further development of instantaneous inter-communication. The World War seems to have given a similar impetus to the development of the new chemistry—synthesis, catalysis—high pressures and temperatures all working toward, and accelerated by, mass production. Here we find chemistry to-day and we know we are on the threshold of surpassing new discoveries which I am convinced is but the beginning and which as knowledge advances will expand beyond the most imaginative dreams of to-day.

The chemist however must acknowledge his indebtedness to the other sciences in all directions. His mechanical equipment is improved by a new metallurgy, the vast results of electrical research have been brought to his service. The electric furnace has given him higher temperatures with the resulting carbides, rare metals and alloys adding resistance to corrosion and marvelous new characteristics to metals as well as unexpected products for his use. The engineer has devised for his use mechanisms of vast strength and accuracy which makes the manipulation of large masses of material possible. Pure science has brought

**Extracted from an address before the Salesmen's Association of the American Chemical Industry, New York, November 23, 1928.*

to light new elements which gradually find their place and multiply by unmeasured numbers his possible combinations. Elements hitherto difficult to obtain or far too costly are now among the common places of commerce and the sun gas helium now raises man to the sky. Exploration has developed new adequate sources of supply and increasing world demand as civilization spreads and becomes fixed, is furnishing a market beyond the dreams of avarice. It can be seen that the increasing number of research laboratories organized by the great industries, whether directly in chemistry or in other fields, has set to their task a vast army of workers who are given unlimited opportunity to apply pure science to the solution of the practical demands of this work-a-day world. These applications of pure science to commercial uses are in themselves rapidly creating new requirements. Yet who shall dare to say that with all this we are far beyond the threshold of the new chemistry.

The Three Great Factors

There are three great factors in every industry,—capital, production, and distribution. The chemical industry in the United States has adequate capital. It is the duty of capital to select and determine upon the strategy of location, to provide funds for the building of plants, to secure adequate mechanism for production, to finance and provide for the collection of raw materials, to advance the necessary funds for carrying sufficient stock, to finance the business transactions that follow production and to bring back into the treasury of the company the receipts of distribution. It is the duty of production to demand and install superior structural and mechanical facilities, utilize to the full the technical staff, to build up enthusiasm and loyalty in a class of intelligent employees who can be depended upon to convert the raw materials into a finished product of the highest quality.

You as Salesmen are a necessary factor in distribution but neither you nor the division of production can succeed if capital is not intelligent, if the strategy of location is not sound or the requirements of raw materials are not provided.

While production cannot continue without these necessary provisions capital cannot succeed unless intelligent economy is practiced and quality maintained. If both these requirements are skillfully met both depend upon you to get the signature on the dotted line and neither you nor they are the whole thing by any means. If your combination of capital, production and salesmanship has greater ability than has your competitor it will succeed, if your competitor has greater ability in these three particulars he will succeed. While each company may feel justified in believing it's combination the best, it is well to resort frequently to searching self analysis. It is not wise to under or over estimate your competitor for he is human too. All this calls for loyalty and untiring devotion and a complete understanding of mutual dependence. There is no room in these days for a slacker either in capital, production, or salesmanship. We must remember that in the chemical industry more than in any other we find new inventions, new substances, and new applications displacing and superseding articles which have long been known to commerce, methods which have become classic, locations which have been assumed to be permanent for centuries, and when undreamed of opportunities and hazards arise when another atom is successfully attached to an old molecule. It is your duty to study your particular commodities to the very bottom, to acquire a complete collateral knowledge of all the surrounding influences which tend to better your products, search out every field which it can possibly enter. In your contacts you should be qualified to grasp every item of information which indicates the possibility of new competitive substances that you may warn capital and challenge production. The price of your success is studentship and work. In the vast industry with which you are connected, this is true to the highest degree. We are entering the chemical age. You are doing your part to bring that about.

The most satisfactory specific thing which I can say to salesmen in the chemical industry is that you are important factors in the progress of the world; you are doing your great part in advancing industry, you are helping to develop a better civilization and through this better men. The highest attainment is to be useful to the world and your opportunity is not surpassed.

America-Chemical Center

America, with its vast resources, its geographical location in relation to the high seas, with the genius of a people of one language and its general characteristic of energy, fearlessness and loyalty is becoming the home of chemical development. Our country is already surpassing and destined beyond peradventure, to dominate the chemistry of the world in the age of chemistry. Quality and quantity are twin brothers in this our country. In our normal home markets lies the foundation for enormous enterprises making quantity production inevitable. With the advantages of a technical development and opportunity which are drawing to us and here developing the talent of the world we can look forward to the future of the chemical industry of America with supreme confidence. You are a part of that chemical industry; as it progresses you will progress and in what field is there a promise of a greater future ? If you are proud of your connection with this industry to-day what will you be in ten years or twenty years ? What could give a man greater inspiration than present achievements in their indication of what is to come? Its future is your future. Do your part and help make the chemical industry what it is destined to be and you will be sure to prosper in a splendid occupation.

Budgeting Expenditures

of Plants and Equipment

By J. J. Berliner

Senior Member, National Account System

To keep the plant and equipment operating efficiently involves a large number of constant expenditures. These expenditures may be classified as follows: (1) Repairs — These expenditures are necessary to keep the plant and equipment in such condition that it can be operated efficiently. (2) Replacements — These are expenditures made to replace old equipment that is worn out and discarded. After a certain period of time, equipment reaches the point where it can no longer be operated profitably and must be replaced by new equipment. (3) Improvements — These are expenditures for new patents and improvements to equipment, lengthening the life of the equipment or increasing the capacity or efficiency of the equipment. (4) Additions — These are expenditures for new equipment caused by the expansion of the business to take care of the increased volume of business.

To maintain an effective control over expenditures for plant and equipment, the following is necessary:

(1) A proper analysis must be made of the expenditures to determine their classification, and a record must be kept to show correctly their effect on the financial condition of the business.

(2) A proper control must be exercised over the amount of the expenditures sufficient to provide a well-equipped and efficient plant, and at the same time, prevent the expenditures of more than is necessary to secure this result.

From the accounting viewpoint, repairs are usually considered as a current expense to be charged against the income of the period in which they occur. However, if for any reason, the cost of repairs fluctuates and it is desired to distribute the repairs evenly, this may be done by estimating the average cost of repairs on the basis of past experience, and future estimations and setting up a reserve for repairs. Under this method there will be charged to expense and credited to reserve for repairs at the end of each period, an amount equal to the estimated average cost of repairs. As the repairs take place, they are charged to the reserve for repairs. Since the credit to the reserve account is not made until the end of the period, and the repairs are charged to it during that time, the account may show a debit balance during the period, but this balance will be adjusted by the credit entry before the financial statements are compiled.

The cost of replacements is not an expense of the period in which the replacement takes place, but of all the periods during which the equipment that is replaced has been used. Thus, if a machine cost $2,000 in 1922, is replaced in 1927 by another machine costing the same, each of the five years should be charged with a part of the cost. If the scrap value of the machine is $200, the five years must be charged with $1,800 ($2,000-$200) or $360 for each year. Since the actual expenditures for any particular equipment take place at one time, and not during each year of its use, it is customary to credit the estimated depreciation to a Reserve for Depreciation account and to debit an expense account for the same amount. When an asset is sold or discarded, it is charged against the reserve account. By this means, the cost of equipment is charged against the income of the periods which benefit from its use.

When improvements are made, future periods will be benefited either through the increased efficiency of the equipment concerned, or through its longer life, and hence the postponement of replacement costs. In any case, since future periods are to receive the benefit of such improvements, these periods should bear their cost. Hence, improvements are charged to asset accounts, and are not reflected in the expense accounts of the period in which they are incurred.

Additions, like improvements, are expected to benefit future periods, so their cost is not charged to the period in which they are obtained, but is distributed over the periods during which they are used, by means of the periodical depreciation charger. Hence, additions are a capital, and not revenue charge.

Summarizing the foregoing, plant and equipment expenditures can be divided into two main groups:

(1) Those which are made in order to maintain the present equipment. Repairs and replacements are included in this group. Such expenditures may be termed maintenance costs. They must be included in the periodical expense accounts. (2) Those which represent an addition to the assets of the business. Improvements and additions are included in this group. Such expenditures are termed plant and equipment costs and are charged to the asset account.

To exercise effective control over disbursements for plant and equipment, the following points must be kept in mind:

(1) Data must be available to show results of past operations and serve as the basis of future plans.

(2) After all the available data has been considered, the plans which have been formulated must be expressed in workable form by means of a budget on plant and equipment. Sometimes two budgets are made, one on maintenance costs and one on the cost of improvements and additions. The requirements for each are sufficiently similar to make their joint discussion possible.

(3) After the budget is completed, it is necessary to have records and reports prepared which will make possible the control of such expenditures and the enforcement of the budget plans.

Date for Plant Control

The data required to serve as a basis for the control of plant and equipment expenditures may be obtained from the four following sources:

(1) The accounting and statistical records with reference to past experience. (2) Calculations based on predetermined factors. (3) The consideration of future plans. (4) The investigation and study of experts.

To control expenditures for plant and equipment, it is necessary to make first, a proper classification of the plant and equipment and secondly an accurate estimate of plant and equipment expenditures. In a manufacturing business for instance, plant and equipment expenditures will vary with the production program. If the production program is to be increased, it will be necessary to either secure additional equipment or use present equipment more extensively. In either case, additional expenditures will be incurred and the amount of their production capacity can be estimated. For past production capacity to be accurate, a record of each unit of equipment is necessary.

If the present equipment is to be used more intensively, this will increase the maintenance cost, and an estimate of this increase must be made. It should be obvious that a change in the production program may not affect all the equipment of the business to the same extent. For instance, it may be planned to increase the output of only one department; and if the previous maintenance expense of this department is shown separately from that of other departments, a more accurate estimate of the increase can be made. It will be necessary, however, to know more than the total cost of the maintenance of the department. The new program will probably affect some units of equipment in the department more than it will others. It is desirable, therefore, to have records which will show each unit of equipment in the department, and the maintenance expense incurred on it. This is accomplished by keeping a plant ledger.

A plant ledger is a record which contains an account with each unit of plant and equipment. It serves as a subsidiary record to the controlling account or accounts with plant and equipment kept on the main ledger. The plant ledger is usually kept on cards or loose-leaf sheets, each card or sheet providing a record of one unit of equipment. The size of this unit will depend on conditions. There may be a separate account for each machine, or, if several machines of the same pattern and size are purchased at the same time, they may all be recorded in one account. Each account in the plant ledger, however, should show at least the following:

(1) The original cost of equipment and the date of purchase.

(2) The amount of depreciation accrued on the equipment to date.

(3) The amount of repairs made on it to date.

(4) Its present book value.

The repairs entered on the plant ledger account do not affect the value on the equipment since they are treated as an expense and are never added to the asset. It is, however, useful to have them entered on the plant ledger account for memorandum purposes so that in making future estimates, it is possible to obtain information of the past cost of repairs, not only in total, but also by departments and by units.

As equipment wears out, its replacement must be provided for. This provision is accomplished by charging a certain amount to the expenses of each budget period and crediting a like amount to a reserve for depreciation. In the calculation of the depreciation charge, three things must be taken into consideration: The original cost of the asset, its anticipated life, and its estimated scrap value. By substracting the scrap value of the asset from its original cost, it is possible to determine the cost of the use of the asset during its period of life. This cost is usually distributed over the period of its life in such a way that each budget is charged with its equitable share.

Future Plans Based on Costs

After the maintenance costs of past periods have been obtained, it is necessary to determine the effect of future plans on these costs. If a large increase in production is planned, the increased cost of maintenance arising from this increased production must be estimated. If new methods of manufacture are to be employed, the resulting change in maintenance cost must be calculated. If new equipment is to take the place of old, the maintenance cost will be affected. If it is planned to keep the equipment in better repair so as to make it more efficient and prolong its life, this change must be considered.

In considering the relation of maintenance cost to future plans, various comparison should be made. Some items of maintenance cost will vary in proportion to production volume. To estimate these, it is necessary to determine the rates of the volume of

production to these costs during the period. By applying this ratio to the estimated volume of production for the current period, an estimate for the period can be obtained. Some items of maintenance cost will vary more nearly with the floor space used than with the production volume. Therefore, the ratio of floor space used in the past period to these items of maintenance expense during the same periods will be obtained, and the ratio applied to the estimated floor space of the current period. Other items of maintenance costs may vary in proportion to the number of units of equipment used and their amount will be correspondingly increased.

It is desirable that a periodical inventory or appraisal be made of plant and equipment and used as a means of checking the plant ledger and as a basis for budgetary plans. It is also possible that too liberal depreciation may be allowed or too extensive repairs made, and such an appraisal will disclose this fact. Such an appraisal will also show when it is better to purchase a new machine, rather than repair an old one.

The Plant Engineer's Job

Many manufacturing concerns have on their staffs a plant engineer, who is responsible for:

The study of improved methods of factory construction; present factory layouts and present executive approval for proposals for improvements based on costs and savings; study of machinery, equipment and tools; preparation of a periodical plant and equipment program, made in collaboration with the planning and engineering departments; presentation of the plant and equipment program for approval and transmissions to the central executive committee of the company; periodical maintenance plan as proposed by the works maintenance departments; and supervision over the executive of the plant and equipment and the maintenance programs as approved by the central executive committee of the company.

The Budgetary Plan involves a consideration of the contents of the plant and equipment budget; the responsibility for its preparation; the form in which made; and the manner in which used.

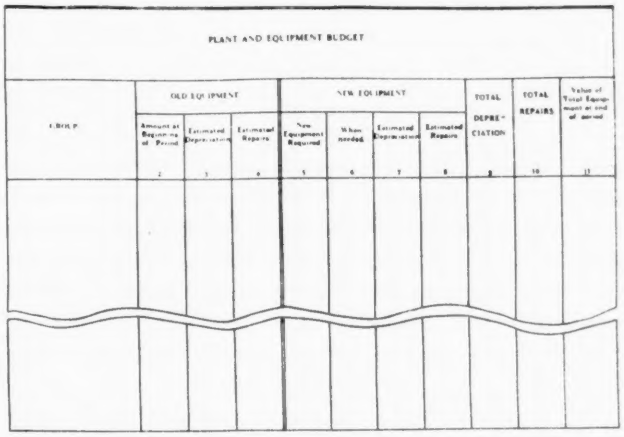
The plant and equipment budget should state the following: the anticipated repairs and estimated depreciation on the present plant and equipment; the estimated cost of new equipment which should show: (a) cost of factory equipment, and (b) cost of equipment for administrative and selling units of the business; (c) anticipated repairs and estimated depreciation on new equipment.

The executive in charge of production is responsible for the preparation of the plant and equipment budget so far as it relates to the factory. This responsibility he will delegate to the plant engineer who in turn will employ the assistance of the works maintenance department and the works engineering department. In calculating the depreciation charges, they may avail themselves of the service of the accounting department as well.

No standard form for the plant equipment budget can be presented. Form 1 shows what information it should contain. In filling in columns 4 and 8, the plant engineer will consult the works engineering department for information with reference to the cost of repairs. The works maintenance department will supply information with reference to the amount of repairs to be made. If the company produces its equipment, the works engineering department will supply the data needed for column 5. If the new equipment is to be purchased from outside sources, the purchasing agent will supply this data. Column 6 on the plant and equipment budget states when new equipment is desired. With this as a basis, the purchasing agent will state the terms, on which the equipment will be purchased and show the date of payment. This information is necessary for the preparation of the financial budget. If the equipment is to be produced by the company, an estimate must be made of the disbursements necessary for its production. The date given in column 6 is the date when the completed equipment is desired.

The budget for plant and equipment consists of an estimate of the expenditures necessary for maintaining the present equipment and securing and maintenance of the additional equipment demanded by the budget program.

The estimate of the cost of repairs or construction can be made in two days. If the business maintains an engineering department, this department can be asked to make the estimate. If it is not pos-



PLANT AND EQUIPMENT BUDGET

GROUP	OLD EQUIPMENT			NEW EQUIPMENT				TOTAL DEPRE- CIATION	TOTAL REPAIRS	Value of Total Equipment at end of period
	Amount at Beginning of Period	Estimated Depreciation	Estimated Repairs	New Equipment Required	When needed	Estimated Depreciation	Estimated Repairs			
	2	3	4	5	6	7	8	9	10	11

Fig. 1—Form for plant and equipment budget

sible or not desirable to have engineers make the estimate, it can be made by the cost accounting department on the basis of statistics obtained from the records showing previous costs. If co-operation between the accounting department and the engineering department is secured, more accurate estimates will be obtained.

If the requisition calls for the construction of equipment by the factory, careful records should be kept of the cost of the construction. The method of

determining these costs is very similar to the method of determining the cost of goods manufactured for sale. Each requisition, after it has been approved, is given a number, and a construction order is issued authorizing the job. An account is opened on the cost records and all costs incurred in the construction are charged to this account. When the construction order is completed, a report is made showing the estimated cost and the actual cost.

With the comparative figures available, it is possible to determine the cause of variation. Unless such comparisons are made, it is impossible to exercise any effective control over the cost of construction work. Every attempt should be made to obtain accurate costs in connection with construction and repair orders.

It is usually not possible to estimate exactly each item of plant and equipment cost which must be met during the budget period. Such expenditure cannot always be foreseen. It is desirable to anticipate these additional costs by including an item in the plant and equipment budget to cover them. Since these additional costs vary from period to period it is well to credit a reserve account for the amount included in each budget to provide for them. When the costs are incurred, they can be charged against the reserve. These additional costs may be due to rising costs of material and equipment, labor troubles, accidents, increased production, etc. By employing the method outlined above, they can be taken care of as they arise.

MONTHLY REPORT ON APPROPRIATION

Name of Appropriation	No.	Period	Per Cent of Completion	Original Amount	Additions	Deductions	Final Amount	Cash Disbursed	Accounts Payable	Undisbursed Balance	Contract for Labor and Supplies	Balance Available for Future Contracts
1	2	3	4	5	6	7	8	9	10	11	12	13

Fig. 2.—Form for monthly report on appropriations

To exercise effective control over the plant and equipment budget, it is necessary to have periodical reports which will make possible a comparison between the amount appropriated for each class of expenditures and the actual amount expended. A report should be made monthly giving the comparison as shown in form 2.

The report is of service not only to the executive who has control of the purchase and construction of plant and equipment but also to the financial executive. The report shows the former the amount available for future purchases or construction, and it shows the latter the amount which he must plan to finance. The tenth column gives the treasurer information of special value since it states the payments to be made in the near future. Column 13 shows the amount which may be diverted to some other purpose in case of financial stringency.

The following is a brief summary of procedure for budget control of plant and equipment:

1. Requirements for control of plant and equipment.

(a) A proper analysis of plant and equipment expenditures to determine their classification and a record of them which will show correctly their effect on the financial condition of the business.

(b) A proper control of the amount expended for plant and equipment to the end that sufficiently will be expended to provide a well equipped and efficient plant, and, at the same time, prevent the expenditure of more than is necessary to secure this result.

2. Control of the Expenditures Required.

(a) That data be available which will show results of past operations and serve as a basis of future plans.

(b) That plans be formulated with basis of this data and be expressed in workable form by means of a plant and equipment budget.

(c) That records be maintained and reports made which make possible the enforcement of the budget formulated.

3. Data Required as Basis of Control.

(a) That which is obtained from the accounting and statistical records with reference to past experience.

(b) That which is obtained by mathematical calculations based on predetermined factors.

(c) That which is determined by a consideration of future plans.

(d) That which is obtained as a result of the investigation and study of experts.

4. Plant and Equipment Budget Shows.

(a) The anticipated repairs and estimated depreciation on the present plant and equipment.

(b) The estimated cost of new equipment including: (a) cost of factory equipment, and (b) cost of equipment for administrative and selling units.

(c) The anticipated repairs and estimated depreciation on the new equipment to be secured.

5. Records and Reports for Control of plant and Equipment Budget includes:

(a) Requisitions for all purchases of equipment and for all construction of equipment or repairs.

(b) Estimates of cost of purchases or construction which accompany the requisition.

(c) Records of the cost of all construction or repair work performed by the concern.

(d) Reports showing a comparison of estimates and costs.

(e) Reports showing a comparison of expenditures with budget allotments.

Trends in Industry and Expansion

The United States Chamber of Commerce has taken a leading role in the education of prospective fertile industrial communities. In this talk before the representatives of one of these communities, Mr. McCullough attributes the great stir in industrial life to research, listing the chemical industry among the first five leaders in this work.

By E. W. McCullough

Dept. of Manufacture, U. S. Chamber of Commerce

EVERY progressive industrial community should be vitally concerned in the success and progress of its home factories which provide jobs and payrolls to so many of its citizens, who in turn spend and contribute to the support of local business and enterprises of every kind.

Manufacturers have quite different problems than those of other business people in that they buy their materials largely in outside markets and find sale for their products away from the local market.

Their success, therefore, while dependent to some degree on location and home co-operation, their great battleground is in the competitive markets of the country, and it is with reference to these I want to confine my remarks. Through discussing the trends in manufacturing with the manufacturers present, I hope to convey a picture to you of the industrial situation as it exists generally throughout the country and what factors should receive consideration when more industrial expansion is planned. Also, how the interest and sympathy of the community can be made useful to its present manufacturers in aiding them in holding their own in meeting the competition of other industrial communities, for in marketing everything they produce they must fight for trade.

Favor Home Establishments

In my opinion, in giving consideration to the matter of bringing in more factories the interests of those already on "location" should have first consideration: First, because they have already risked their capital and have proven their ability to succeed, and secondly, because it is better to build around them lines which if possible will complement them and in that way help the old and the new to succeed.

By complement plants, I mean those which will make materials or accessories the others need, or are lines which do not conflict with theirs in either buying or selling markets or for labor. This cannot always be done, but it should have consideration when proposals are made to move in factories or build new ones with public aid. If you are going to be generous toward the newcomers and intend to give them concessions or advantages it is well not to forget the older members of the family, for increased payrolls from your present factories are likely to be more steady or permanent than from any of the new ventures. If these policies are pursued, then your present factories should co-operate with you in building up the community through the securing of more desirable plants.

The Effect of Keen Competition

Turning now to what is occurring in industry throughout the country and what it means to those factories which are neither large nor small, but which, while successful for many years, are now feeling the effect of the evolution in industry developed since the War, more particularly within the past seven or eight years — Competition has increased, so have selling costs, and profits are gradually getting less notwithstanding the volume of business is greater and the buying power of the consumer has not lessened.

Governmental restrictions on imigration forced the development and use of labor-saving machinery and today the back-breaking jobs formerly assigned to common labor are performed by the dredge, steam-shovel, overhead carriers, ore and coal loaders, automatic stokers and thousands of other like equipment.

Man labor in many industries has been increased in production with the aid of power and machinery four times — this means a greater volume of production at lower cost and eventually lower prices to the consumer placing whatever the commodity within the reach of a greater number, that is making the consumer's dollar go farther — automobiles and clothing are fitting illustrations but there are many others.

Machinery and better planning have set a new pace in manufacturing and involve many new problems in management and control, not the least of which are overproduction and distribution.

You are all well aware of the changes in style, design, and utility of lines considered for more than a

generation as staple, even those you are yourselves making — some lines have been entirely swept out of production — the horse-drawn vehicle, which at one time was produced in hundreds of factories, employed millions of capital and thousands of men. Stoves which consume other than gas or electricity as fuel are on the wane — and so it goes!

Of the newer commodities and lines replacing the old or changing them in form, it is said that today five of these, i. e., the automobile, motion picture, radio, chemical and electrical industries employ or furnish a living to over 30,000,000 people. This has come about through research, the most potent arm of greater efficiency.

It is useless to contend that this is a passing state of public mind and commodities or lines so affected will "come back," for you and I know they never will, for we are in an age of increased intelligence and advance.

This progress not only casts out old types and styles but seriously affects factory buildings, machinery, equipment and processes, and we have only to look about and compare the factory set-up of today with that of 25 years ago.

Methods of selling and distribution have undergone similar changes, some of them quite unnoticed in individual cases.

Too often, the full significance of this evolution is under-estimated and we are inclined to agree with those who cry, "the big fish are eating up the little ones."

Legislation to Help the Small Plant

Competition is becoming more intense and difficult, especially for those handicapped by obsolete conditions in plant, equipment and management, and who have not yet undertaken to take stock of themselves and their problems.

Because of the evident progress being made by those using ample capital and modern methods, those in the former class are appealing to the government for aid through legislation to permit trade groups or associations to regulate competition through concert of action, that is to find an average cost of producing a commodity and fix a price that will yield a fair profit to the producer and a just price to the consumer.

This looks ideal, but is economically impossible, for no such group could be equal in ability to produce with the same economy or efficiency and to afford protection to all the price would be based on the costs of the least efficient — thus giving him a bare margin, but a large one to the low-cost producer. Even if such an arrangement were sanctioned, the stress of supply and demand — the economic law — would soon render it quite ineffective.

If one enters into a race or a game for a prize he cannot win unless he pays the price in training and complying with the rules — this is equally true in manufacturing, for no longer is there an unlimited market before the producer — We are in a buyers' market and likely to be so indefinitely, therefore, must contest for existing markets with those in our line and we can only win on the basis of merit of product and prices based on fair profit and service.

This is neither difficult nor hopeless if we meet the conditions. The big, inflexible plant, capable of low cost production while running full, is not the answer, for plants must run steadily to keep down overhead expense and furnish constant employment to labor to get the best results. Already, many of our newer and best managed industries are getting away from building very large units and leaning more strongly toward those commensurate with the market to be supplied and building them near to it.

Help Through Co-operation

As men neither live to themselves nor die to themselves if they are accredited successful, neither do businesses. Individualism has its limitations and isolation its handicaps. Business and industry today are too complex for a single human mind to comprehend all about it — that is the problem which confronts management today.

How and where may the needed information be obtained ? Simply where it is developed, in the given industry or in the trade association representing the industry, if properly organized.

Just a word concerning trade associations — every line of industry should be so represented. The function of such an association is to study and handle the problems of the industry which cannot be handled by the individual members of it — it can be of particular service to the smaller manufacturers, which are greatest in number. An organization can research the problems of the industry and work out remedies and improvements — it can provide the government with data to inform it and prevent inimical legislation, and better still, it can give the members of the industry a statistical picture of what is going on as no other agency can.

The Chamber of Commerce of the United States has created recently a Trade Association Department, with an experienced manager and staff, and is serving hundreds of such organizations in dealing with their most difficult problems — this is also backed with the service of ten other departments, all related to business and industry. So there is a big reservoir of help to draw from.

The National Chamber here again provides efficient, practical service for we are heartily in favor of wise industrial development in every community where conditions justify it.

The use of acetic acid in Tientsin is increasing in direct relation to the increase in the manufacture of machine-spun woolen yarn for woolen carpets and rugs. Most of the supplies have hitherto come from Germany. It is estimated that 1928 imports will exceed those of 1927 by 50 per cent. or more.

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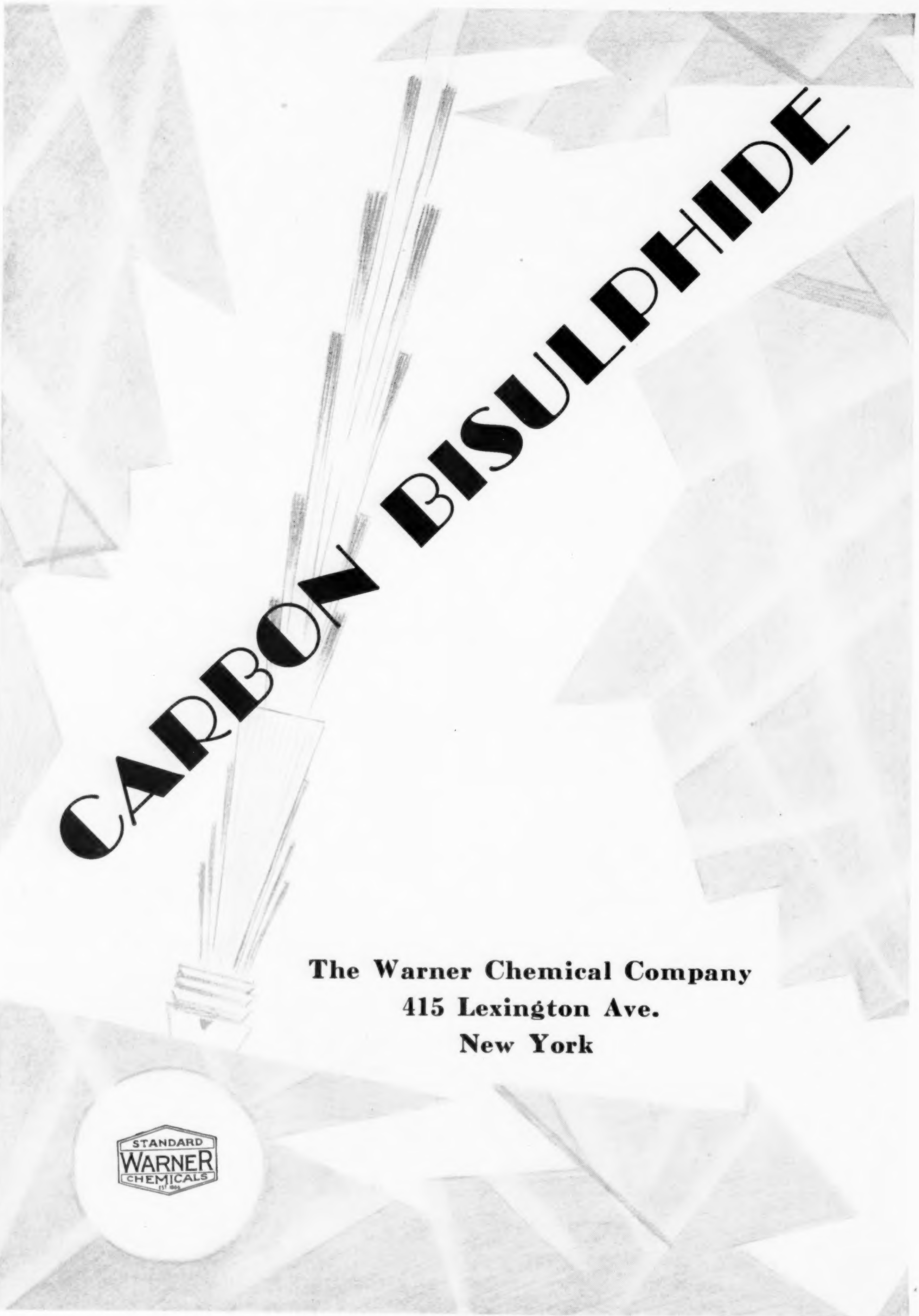
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Chemical Facts and Figures

New Methods and Current Problems Discussed at Coal Conference

Scientists and Economists Gather at Carnegie Tech for Second International Conference on Bituminous Coal —Papers by Leaders in Coal Technology Mark Progress Made During Past Year—Baker Again Chairman of Meeting.

Many big names, both economic and scientific, gathered at the Second International Conference on Bituminous Coal at Carnegie Institute of Technology, Pittsburgh, November 19-24, 1928. The surprising and unexpectedly large measure of enthusiasm aroused by the conference a year ago encouraged Chairman Thomas S. Baker to await with assurance the results of the present meeting. The following were among those who contributed of their knowledge and experience in an effort to solve the common problem of making bituminous coal a more healthy member of the industrial fraternity.

Dr. Carl Krauch, director, I. G. Farbenindustrie, and introduced by Walter C. Teagle, president, Standard Oil Co. of New Jersey spoke on "Catalysis Applied to the Conversion of Hydrocarbons", especially as it has been applied by the I. G.

James Balph, secretary, Coal Carbonization Co., and M. J. McQuade, president, Ben Franklin Coal Co., were responsible for a paper on "Low Temperature Carbonization of Coal by the Hayes Process." This process is at present confined to small operations and requires special alloy retorts.

A paper by Baurat Walter Kleinow, Berlin, was read by Dr. Lionel Fleischmann of the A. E. G., Germany, on the "Powdered Coal Locomotive of the Allgemeine Elektricitaets Gessellschaft."

Dr. Friedrich Bergius, author of a process for low temperature carbonization, made what is as yet a purely theoretical contribution with his paper on "Contributions to Knowledge of the Transformation of Cellulose and Lignin into Coal."

F. zur Nedden, Dipl.-Ing., secretary, Fuel Committee of Reichskohlenrat, Berlin, Germany, made one of the outstanding impressions with his paper on "Coal, Hydrogen and Capital." He brought out the fact that the higher the quality of the fuel into which coal is transformed, the greater is the amount of capital investment required per ton of annual throughput of coal, and also discussed the ultimate economic results of investments of capital in plants for improvement of coal.

Dr. F. P. Kerschbaum, technical advisor, Metallbank and Metallurgische Gesellschaft, discussed "Modern Developments in Lignite Carbonization"; and Yoshisada Ben, Chemist, Imperial Fuel Research Institute, Tokio, the low temperature carbonization plant at that institute.

F. A. F. Pallemaerts, manager of research, Division of Coke Ovens and Synthetic Ammonia, Union Chimique Belge, described the combined synthetic ammonia and coke oven plant of the Union Chimique Belge at Ostend, which produces $18 per ton ammonium sulfate and 2½c pound ammonia.

Josef Plassmann, director, Chemisch-Technische Gesellschaft, was the author of a very good paper, read by Hans Sieg, Berlin, on "The Conversion of Slack Coal and Fines into Lump Smokeless Fuel—Low Temperature Coke—by the C. T. G. Process." Dr. J. P. Arend, director, Societe Arbed et Terres Rouges, Luxembourg, read a paper on "A New Method for the Determination of the Best Temperature for the Hydrogenation of Coals."

F. G. Tryon, Washington, D. C., presented a very interesting and complete "Analysis of the Consumption of Coal in the United States."

W. H. Allen, Jr., chemical engineer, American Gas & Electric Co., spoke on "Low Temperature Distillation of Coal by the Carbocite Process." He described the process used and results secured at an experimental plant, with the practical economic side of the development of the process. He also suggested the possibility of low temperature distillation plants operating in connection with power plants, and providing gas and tar products as added inducements to the low cost of power.

W. L. Robinson, superintendent, Fuel and Locomotive Performance, Baltimore & Ohio Railroad, spoke very interestingly on "Locomotive Fuel" outlining methods of supervision employed to insure economical utilization and principal requirements of coal for satisfactory performance.

Dr. R. P. Soule, chief technologist, International Coal Carbonization Co., described "The 'KSG' Low Temperature Carbonization Plant at New Brunswick, N. J." This is the first installation in the United States and the description of the methods and results proved of unusual interest.

Favorable comment was also heard upon the paper of Dr. Franz Fischer, Kaiser Wilhelm Institut fur Kohlenforschung, on "The Formation of Benzol and Other Hydrocarbons by the Action of Heat on Methane"; upon that of Dr. Ing. J. E. Noeggrath, Berlin, on "Pressure Electrolysis and Its Influence on Fuel and Power"; and that of Dr. Hugh S. Taylor, Princeton University, on "The Part of the Catalyst in Coal Processing."

Rhodia Transfers Sodium Phosphate Account to Harshaw, Fuller & Goodwin

Rhodia Chemical Co., New York, announces that effective January 1, 1929, it will transfer its di and tri sodium phosphate account to Harshaw, Fuller & Goodwin. Since the acquisition of Meteor Products Co., the Rhodia Co. has had the sole American representation of Gebreuder Giulini G. m. b. H., Ludwigshafen, Germany on these items.

This action is deemed advisable because of the fact that Rhodia is primarily a manufacturer of fine, medicinal and aromatic chemical and perfumers raw materials and not properly equipped to handle the sale of heavy chemicals. This step likewise marks the termination of the company's heavy chemical department, though the importation of technical pyridine will be continued.

Bayer-Semesan Co., Inc., is formed to take over the business formerly conducted by the seed disinfectant divisions of the Bayer Co., Inc., and E. I. du Pont de Nemours & Co., Inc. The merger was formed in order to avoid legal controversy in regard to patents and inventions claimed by both the Bayer and du Pont companies. All business formerly handled through separate offices of the two companies will now be transacted through the offices of the Bayer-Semesan Co., Inc., at 105 Hudson st., New York. Officers of the company are president, W. E. Weiss; vice-president, J. Warren Kinsman; secretary, E. I. McClintock; treasurer, J. B. Eliason; sales manager, K. N. Chase; assistant treasurer, L. C. Reed; advertising manager, H. E. Fry.

Judge Morris, in United States District Court recognizes sale of patents to Chemical Foundation Co. and dismisses claims of certain German inventors in equity suit brought by Chemical Foundation Co. against E. I. du Pont de Nemours Co. and Frank White, as Treasurer of United States. It was found Chemical Foundation was entitled to license fees resulting from three patents around which suit hinged. Claim of Alien Property Custodian also was dismissed, it being found he had no claim to patents after having sold them when they were seized by government.

Personal and Personnel

Among those who attended the first National Tariff Conference at the Waldorf Hotel, New York, November 26, were E. M. Allen, Mathieson Alkali Works; Curtis R. Burnett, American Oil & Supply Co.; J. A. Burchel, Du Pont Viscoloid Co.; H. L. Derby, Kalbfleisch Corp.; William A. Hamann, Roessler & Hasslacher Chemical Co.; H. M. Hubbard, Royal Baking Powder Co.; E. H. Killheffer, Newport Chemical Works; E. G. Kohnstamm, H. Kohnstamm & Co., Inc.; August Merz, Heller & Merz Co.; Herman A. Metz, Consolidated Color & Chemical Co., and Grasselli Dyestuff Corp.; Stanley Williamson, National Carbon Co.; Will E. Walker, Anasarcin Chemical Co.; H. S. Wardner, N. J. Zinc Co.; and F. G. Zinsser, Zinsser & Co.

Dr. E. C. Sullivan, Corning Glass Works, Corning, N. Y., is awarded Perkin Medal for 1929 for his work on special glasses of the pyrex type. Committee of award consists of representatives of the American section, Society of Chemical Industry, American Chemical Society, Societe de Chimie Industrielle and American Electrochemical Society. Presentation will be made January 4 at Chemists' Club, New York, at joint meeting of four societies.

Van Devanter Crisp, resigns as secretary, Allied Chemical & Dye Corp., to become associated with McConnell & Co., member of the New York Stock Exchange. Henry F. Atherton, secretary, National Aniline & Chemical Co., has been made secretary also of the Allied Chemical & Dye Corp.

H. O. Moraw, for eight years with Bureau of Chemistry, Department of Agriculture, and for twelve years in promotion work in the chemical industry, is appointed a specialist in the Chemical Division, Department of Commerce.

Dr. Charles H. Herty, New York, industrial chemical consultant, is retained in advisory capacity by Industrial Committee, City of Savannah, and by the Pine Institute of America.

Francis M. Turner, Jr., editor-in-chief, Chemical Catalogue Co., Inc., and vice-president since 1925, is elected president of the company.

Augustin Edwards resigns from position as chairman of directorate, Anglo-Chilean Consolidated Nitrate Corp.

Harry Pfeffer, president, American Solvents & Chemical Corp., New York, returns after four months' visit to England and France.

Sir Joseph Turner, formerly joint managing director, British Dyestuffs Corp., Ltd., is chairman of the recently organized Netherlands Artificial Silk Co., Ltd.

Captain Asa F. Davison is elected president, American Benzol Corp., to succeed Adolph Prussin, retired.

George C. Foedisch, Philadelphia, is elected a director, Pennsylvania Coal & Coke Corp., succeeding John MaGee, resigned.

A. J. Fitch, works manager, Cumberland plant, Celanese Corp. of America, is elected a director.

F. Edson White, president, Armour & Co., Chicago, is elected to board of directors, Air Reduction Co., Inc., New York.

Potassium Permanganate Tariff Increased After Cost Investigation

Duty on potassium permanganate is increased 50 per cent. by proclamation of President Coolidge issued November 16. The duty is effective December 16. The present rate is 4 cents per pound and the increase of 50 per cent, which is the maximum increase permitted by law, makes the rate 6 cents per pound. The proclamation stated that Germany is the chief competing country and that the increase was ordered to equalize the production costs in Germany and the United States.

The increase in duty was proclaimed by the president upon recommendation of the Tariff Commission after a cost-of-production investigation. The application for an investigation, looking towards an increase in duty, was submitted November 12, 1926, by Hugh M. Frampton, representing the Carus Chemical Co., La Salle, Ill., the only American producer. The Commission instituted an investigation on May 25, 1927. Foreign costs were secured from the I. G. Farbenindustrie, the only German manufacturer, in September, and from Carus Chemical Co. in November 1927.

The investigation and subsequent public hearings disclosed the information that the domestic producer was at a disadvantage because he had to depend upon imported caustic potash from Germany as a raw material. It also disclosed that the average annual import during 1922-26 was 339,552 pounds. Imports in 1925 were 88,662 pounds; 1926, 235,688 pounds; 1927, 319,332 pounds.

During the past month the question of Muscle Shoals was revived when a congressional delegation visited President Coolidge. He is reported to have told the delegation that he did not wish to put the Government into the retail power and fertilizer business, and that with regard to the Muscle Shoals Bill, killed by pocket veto, he did not favor building another dam at public expense. Although he is said to have expressed willingness to approve the Madden Bill, which provides for the acceptance of the offer of the American Cyanamid Co. and the building of a $30,000,000 dam, this would also be conditioned on having the bill amended to provide for the building of the dam without Government expense.

Salesmen's Association of the American Chemical Industry holds its first dinner meeting of the current season, November 23, at the Drug & Chemical Club, New York. A Cressy Morrison Union Carbide Co., spoke on "The Chemical Industry in its Relation to Civilization" and C. C. Concannon, chief, Chemical Division, Department of Commerce, on the chemical outlook for the next four years as it will be affected by the new administration.

The meeting also marked the first public appearance of "The Chemical Salesman", the new publication of the association. R. E. Dorland, president of the association, reported that there had already been considerable response to the projected employment exchange sponsored by the association.

C. P. Jarden, manager, South Atlantic district, Sherwin-Williams Co., is tendered a dinner by the company, December 3, at the Benjamin Franklin Hotel, Philadelphia, in honor of his twenty-five years of service.

Richard H. Grimm, president, American Commercial Alcohol Corp., New York, is accepted into membership in the Chemists' Club, New York.

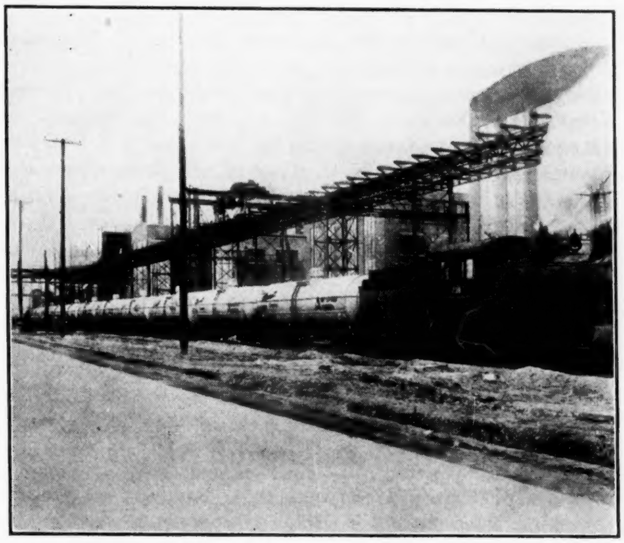
Lord Birkenhead, who recently joined the board of Imperial Chemical Industries, Ltd., also joins the boards of Johannesburg Consolidated Investment Co., Ltd., and Tate & Lyle, Ltd.

Chemical Industries Corp. Formed to Finance Chemical Enterprises

Chemical Industries Corp., a Delaware corporation is formed "for the purpose of acquiring in whole or in part an interest in growing companies in the chemical and drug trade." Capitalization of the new company consists of 250,000 shares of no par value. Arthur D. Mendes, A. D. Mendes & Co., Inc., is chairman of the board; Victor C. Bell, president, and Maurice M. Minton, Jr., vice-president and general manager. Bell and Minturn are both connected with the Mendes concern, an investment security organization.

During the course of an interview with a representative of Chemical Markets one of the officers of the corporation stated that the new company is a holding company only and will take no active part in the operation of any of the chemical or drug concerns during the period of financing. Beyond this point the interview developed into a series of reticent and unsatisfactory answers as to any other plans contemplated by the directors. The impression gathered was that the Chemical Industries Corporation would proceed on its financing policies on the approval of a certified accountant and a likely looking balance sheet without consultation of experts of the industry as to the feasability of the success of the venture.

From other sources it is understood that there will be no sale of Chemical Industries Corp. stock, but that friends of the officers will be asked to take the entire issue. The present value of the stock is placed at $15.00 a share.



The first shipment of anhydrous ammonia from the new plant of Allied Chemical & Dye Corp. at Hopewell, Va., marks an historic occasion. The shipment was made during the closing days of November, 1928. More history will be made with the first shipment of nitrates from the air, which is expected momentarily as this issue of CHEMICAL MARKETS goes to press. It will be the first atmospheric nitrogen produced commercially in this country.

Scottish Agricultural Industries, Ltd., is to be organized in Edinburgh as a holding company to take over control of Alexander Cross & Sons, Ltd., Cross's Chemical Co., Ltd., J. & J. Cunningham, Ltd., John Miller & Co., Ltd., Charles Tennant & Co., Ltd., and Daniel Wylie & Co. Imperial Chemical Industries, Ltd., will own a considerable interest in the new company. Nominal capital is £1,750,000. Its chairman is to be Sir Harry McGowan, president, Imperial Chemical Industries, Ltd.

Emery Industries, Cincinnati, have placed their advertising account with the J. Walter Thompson Co., Inc.

News of the Companies

E. I. du Pont de Nemours & Co., Inc., announces that J. J. Moosmann, formerly division manager, chemical products division, has been appointed assistant general manager of the paint, lacquer and chemicals department, to fill the vacancy caused by death of J. W. Elms. It was also announced that, effective November 1, the chemical products division will be operated as two divisions, with E. M. Flaherty as division manager at Parlin in charge of the industrial finishes division, and G. A. Staples as division manager at Detroit in charge of the automotive finishes division.

St. Louis Sulphur & Chemical Co., St. Louis, Mo., announces that Wishnick-Tumpeer, Inc., New York, has purchased an interest in the company and that R. I. Wishnick, has been elected vice-president and director. The latter company has been distributor of Pioneer Sulfur, a product of the former company. St. Louis Sulphur & Chemical is now planning expansion in plant facilities, to be taken care of by an increase in capital stock. Alfred J. Heyer is president and general manager.

International Combustion Engineering Corp. plans construction of a low temperature coal carbonization plant at Coatesville, Pa. This is said to be the first low temperature carbonization plant identified with the steel industry and the second installation in America. New plant will be owned and operated by International Coal Carbonization Co., a subsidiary, and is expected to be in operation by 1930.

General Paint Corp. is organized in San Francisco by a merger of nine large paint companies including, Brininstool Paint Co.; Hill-Hubbell & Co.; Rasmussen & Co.; Jones & Dillingham; Bradley-Wise Paint Co.; Technical Oil & Paint Co.; Magner Bros. Paint Co.; California Paint Co.; and Seattle Paint Co. E. A. Bradley is president of the organization.

Calco Chemical Co., Bound Brook, N. J., announces that the telephone numbers of its New York sales office has been changed to Barclay 6868-69-70.

Johns-Manville Corp. purchases the properties and assets of the Celite Co. of California, manufacturers of insulating products and filtration materials.

Fire, November 8, wrecks the plant of the Western Industries Corp., Richmond, Cal., resulting in three deaths and estimated damage of $50,000.

Ault & Wiborg Co., Cincinnati, announces that it will discontinue the direct marketing of their dry colors and that W. G. Brown & Co., Cincinnati, will distribute these products as sales agents.

Godfrey L. Cabot, Inc., Boston, is expanding its Pampa and Skellytown, Tex., plants.

Corona Chemical Co.'s plant at Berkley, Va., is damaged by fire causing loss of $40,000.

United Lead Co., formerly a subsidiary, is consolidated with National Lead Co., New York.

Liquid Carbonic Corp. completes arrangements to purchase General Carbonic Co.

Backhaus Elected Vice-President of U. S. Industrial Alcohol Company

U. S. Industrial Alcohol Co., New York, announces that Dr. Arthur A. Backhaus, production manager, has been elected vice-president of the company. He was born in Madison, S. D., August 30, 1889, and received his education at the University of Rochester, being graduated in 1913 with the degree of B. S., after which he took a post-graduate course in chemical engineering at the University of Michigan. The years 1914-1916, he spent as laboratory assistant with Whitaker & Metzger. He left there to become associated with the U. S. Industrial Alcohol Co., first as director of research, from 1916 to 1924, and since that time as production manager. He is a member of the American Chemical Society, the Society of Chemical Industry, the Chemists' Club, New York; the Hillendale Country and the Engineers' Club, Baltimore.

The company also announces that William F. Cochrane has been appointed assistant to the president. He was born in Steele, N. D., May 5, 1886. He received his education at the U. S. Naval Academy receiving his commission in 1907 and serving from that time until 1913 in the U. S. Navy. He then became marine superintendent of the Cuba Distilling Co., which position he occupied until 1928, except for another period of service with the U. S. Navy during the years of 1917-1919. At the same time, he was also, from 1916-1925, chief engineer of the U. S. Industrial Alcohol Co., and also president, Curtis Bay Copper & Iron Works, from 1918-1927.

Standard Ultramarine Co., Huntington, W. Va., announces that effect January 1, it will discontinue its selling arrangements with E. M. & F. Waldo, Inc., Muirkirk, Md., and conduct its eastern business from its New York office. The firm has also appointed Dowdy Bros., Philadelphia, as its representative in that territory, and Downer, Hunnewell & Co., Boston, its representative in New England.

Hercules Powder Co. reorganizes naval stores division as follows: general manager, L. N. Bent; director of production, C. A. Lambert; director of sales, J. E. Lockwood; assistant director of sales, Arthur Langmeier; sales manager, Jesse Gibson; assistant sales manager, C. G. O'Brien; technical service manager, C. E. Kinney.

Royal Baking Powder Co., announces election of William W. Stanley as vice-president and director. He also becomes treasurer of the company, succeeding J. F. Chumasero, retired. S. H. Curran has been elected vice-president and general production manager and W. J. Merrill, vice-president and comptroller. M. W. Self has been elected assistant treasurer.

Borden & Remington Co., Fall River, Mass., announces following appointments in the chemical division: Heyward F. Lawton, Thomas K. Webster, in charge of merchandising and sales; E. M. Holdsworth, office manager. Appointments succeed Henry M. Sessions and Felbert F. Gifford, resigned.

Pennsylvania Salt Manufacturing Co. denies rumors that control has been purchased by the du Pont interests. It was stated that not only were such reports entirely without foundation, but that no such negotiations for a sale have been undertaken or contemplated.

A plant for the low-temperature carbonization of Nova Scotia coal is to be erected at Prescott, Ont., on the St. Lawrence River, according to a report in the *Montreal Gazette*.

Sherwin-Williams Co., announces election of following directors: C. G. Bull, C. P. Jarden, and Henry J. Hain.

Chemical Division, Department of Commerce, Plans Domestic Service

A new phase of activity, designed to meet the demand for a more intensive and organized domestic commerce service, has been inaugurated by the Chemical Division of the Bureau of Foreign and Domestic Commerce. The new work will be in charge of J. W. Wizeman, who has been engaged in the marketing of chemical products for more than 15 years, and who for the past five years has been associated with the Bureau as a specialist in promoting the sale of industrial chemicals abroad.

While the Chemical Division has done some work for domestic commerce, most of its activities have been directed to promoting export trade. It is said that there is no organization functioning fully in solving problems of domestic distribution, although a real need exists for such a service. Some of the matters in which the new section of the Chemical Division will assist business, provided a majority of the interested trade so desires, are studies of distribution methods by commodities, studies of costs of distribution and trade promotion, extension of uses and markets, and utilization of by-products, simplification and standardization, sources and availability of raw materials, buying practices and methods, obsolescence and depreciation of plants and equipment, and periodic statistics on production, stocks, and distribution by commodities and by geographical areas.

Monsanto Chemical Co. Completes Purchase of Graesser-Monsanto

Monsanto Chemical Co. announces that as of November 15, arrangements have been concluded whereby it acquires N. H. Graesser's interest in Graesser-Monsanto Chemical Works, Ltd., England. N. H. Graesser has resigned as managing director and retired from the board, and A. S. Graesser, Admiral Sir R. B. Dixon, K. C. B., and C. H. Beevers have also retired from the board in favor of Monsanto nominees. John F. Queeny, chairman of the board, Monsanto Chemical Works, has accepted the chairmanship and managing directorship of Graesser-Monsanto. Upon completion of this transaction, Monsanto Chemical Works owns 100 per cent of all outstanding capital stock of this company and will operate through it in all parts of the world, except the United States, Canada and Mexico.

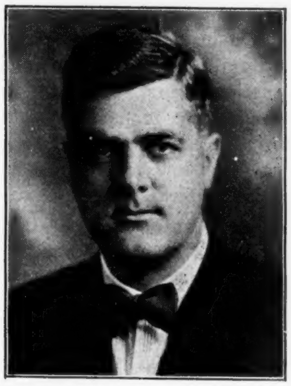
Fertilizer Association Meets

National Fertilizer Association holds Southern convention at Atlanta, November 13 and 14. Among the speakers were: E. L. Robins on "Code Observance and Better Business"; M. Markham Flannery on "Trade Practice Conference Procedure"; Hon. Harry D. Wilson on "The Commissioner of Agriculture and the Fertilizer Industry"; W. A. Shelton on "The Economic Outlook in Relation to the Fertilizer Industry"; L. W. Rowell on "Making Individual Company Advertising Work for the Common Good"; I. D. Carson on "Co-operative Market Development and Industry Protection"; Harry C. Butcher on "Present Advertising Activities of the Fertilizer Industry"; J. C. Pridmore on "European Agriculture and Fertilizer Practice"; C. H. McDowell on "Muscle Shoals and the Fertilizer Industry"; Dr. Firman E. Bear on "The "The Nitrogen Situation"; Chester H. Gray on "Agriculture's Position on Muscle Shoals"; and Charles J. Brand on "Government Relations to Our Industry".

Tariff Commission announces that public hearing set for December 18, 1928, at Washington, in the investigation of costs of production of sodium phosphate, will be postponed until January 15, 1929.

Wilson Receives Chandler Medal

John Arthur Wilson, Milwaukee, authority on sewage disposal, receives the Chandler Medal, at a national gathering of scientists held in Havemeyer Hall, Columbia University, December 7, at which time he delivered the annual Chandler lecture on "Chemistry and Leather". The Chandler Medal is one of the outstanding distinctions in American chemistry, being established in 1910 by friends of the late Professor Chandler.



Mr. Wilson, who is president, American Leather Chemists' Association and former chairman, leather division, American Chemical Society, was consulting chemist to the Milwaukee Sewer Commission and director of research in connection with the development of that city's $25,000,000 sewage disposal plant.

He was born in Chicago, August 16, 1890, and attended New York University and the University of Leeds, England. In 1911, he was assistant chemist, Edison Chemical Works, and the following year joined the staff of A. F. Gallun & Co. Sons., Milwaukee, where since 1916, he has been chief chemist. He was honorary research assistant, Proctor International Research Laboratory, Leeds, 1915-16, and a member, National Research Council, 1920-26.

He has published numerous works on leather manufacture and sewage disposal, and his book, "The Chemistry of Leather Manufacture" is considered the standard work on the subject. He is a member of leading national societies of chemists in America, France and Germany.

Previous recipients of the Chandler Medal have included Leo H. Baekeland, W. F. Hillebrand, W. R. Whitney, F. Gowland Hopkins, Edgar F. Smith, Robert E. Swain, E. C. Kendall, S. W. Parr and Moses Gomberg.

Insecticide Manufacturers Meet

Insecticide and Disinfectant Manufacturers' Association holds fifteenth annual meeting, December 10-12, at the Hotel McAlpin, New York. In addition to addresses by the officers and papers delivered by the members of the association, the following were among those who spoke at some time during the three-day meeting: Peter Dougan, Merck & Co.; Dr. Robert C. White, Robert C. White Co., Philadelphia; Dr. E. A. Back, U. S. Bureau of Entomology; C. P. McCormick, Baltimore; Dr. J. M. Ginsburg, New Jersey State Agricultural Experiment Station; and Dr. Charles H. Peet, Rohm & Haas Co., Bristol, Pa.

The exhibits of various members again were a feature of the convention this year and attracted considerable interest. The annual banquet, with Billy B. Van, president, Pine Tree Products Co., Newport, N. H., acting as toastmaster, was held on the evening of December 11.

Dr. J. K. Haywood, chief, Insecticide, Fungicide, and Caustic Poison Supervision, United States Department of Agriculture, and chief administrator of the Federal Insecticide Act of 1910, dies December 1, at the Emergency Hospital, Washington, D. C.

Edwin H. Smith, Minneapolis branch manager, American Linseed Oil Co., dies at his home in that city, November 12, aged 58.

Ira Remsen, son of the late Professor Ira Remsen of Johns Hopkins University, shot and killed himself, November ,29 in his home at Carmel, Cal.

Supreme Court Rules Commissioner Cannot Refuse Carbon Black Permit

The contention advanced by the Commissioner of Conservation, Louisiana, that he had discretionary power to refuse to issue a permit for the manufacture of carbon black from natural gas is overruled by the Supreme Court of the United States in a decision handed down November 19. The decision, rendered in the case of J. Smylie Herkness vs. Valentine K. Irion, Commissioner of Conservation et al., did not decide the constitutionality of the Louisiana statute upon which the Commissioner had relied for his alleged power, but held that the statute in question did not purport to give the Commissioner the power asserted by him.

A decision handed down by the District Court of the United States for the Eastern District of Louisiana, upholding the Commissioner, was reversed by this decision of the Supreme Court. The latter, read by Justice Brandeis, declares that:

"As it is clear that the refusal of the Commissioner was not justified by any statutory provision, we have no occasion to consider the limitations imposed by the Constitution of the State upon discriminatory action and upon delegation of legslative power to an executive department."

Howard W. Sherrill Dies

Howard W. Sherrill, president, Welch, Holme & Clark Co., New York, dies unexpectedly at his home in East Orange, N. J., on November 5, aged 40. He was born in New York, May 15, 1888, and was educated at Newark Academy and Princeton University, being graduated from the latter in 1909. Since that time, except for two years, 1917-1919, as an ensign in the U. S, Navy, he has been associated with the firm of Welch, Holme & Clark Co. He was elected vice-president in 1909 and president in 1924. He was a member of the Columbian Club, the Green Brook Country Club and the Nassau Club.

Sidney Johnston Jennings, vice-president, United States Smelting, Refining & Mining Co., New York, dies November 17, aged 65, He was born in Hawesville, Ky., and was graduated from Harvard University in 1885. He had been with the company since 1907, when he came as vice-president in charge of exploration and new investments. At his death he was also president, Hanover-Bessemer Iron & Copper Co.; president, United States Fuel Co.; and director, United States Homes Co. and Richmond-Eureka Mining Co. He was president, American Mining Congress, 1922-23, and president, American Institute of Mining Engineers, 1918-19.

Lorenz R. Schwerin, president, Casein Co. of America, dies in New York, November 14, aged 59. He was born in 1869 in Philadelphia, educated in the schools of that city, and had been engaged in the milk products business for many years. He came to this city twenty-six years ago and in a consolidation of companies became president, general manager, and director of the Casein Co. He was also head of the Dry Milk Co., the Casein Manufacturing Co., the Erinoid Co., and the National Milk Sugar Co.

Dr. Sabin von Sochocky, consulting chemist, United States Radium Corp., dies November 14, aged 46, at his home in East Orange, N. J., after a year's illness with aplastic anemia reported to be due to radium and mesthorium poisoning. He was born in 1882 in Austria, received his medical training in the University of Moscow, and came to this country in 1906.

Victor B. Faulkner, chemical engineer, National Aniline & Chemical Co., Buffalo, dies November 15, aged 38. He had been with the company since 1919.

The Financial Markets

Newport Co. Issues New Stock to Finance Purchase of Acme Products

Offers 130,000 Shares of Convertible Stock at $50 in Public Financing—65,000 Shares of Common Stock also to be Offered to Stockholders at $20 — New Company takes over Atlantic Coal Tar Distillates—New International Rayon Holding Company Formed.

Newport Co., Passaic, N. J., offers December 4, 1928, 130,000 shares of class A convertible stock, priced at $50 and accrued dividend, which is cumulative at rate of $3 annually.

The Company at present operates dyestuffs and chemical plants at Carrollville, Wis., and Passaic, N. J., and naval stores plants at Pensacola, Fla., and Bay Minette, Ala. The company has recently acquired the General Naval Stores Co., Inc., through which the products of the Newport Co. and of the Acme Products Co. have been marketed.

Combined sales of the three companies in 1927 exceeded $7,500,000. Consolidated earnings for 1928, with the last quarter estimated, are expected to approximate $820,000, or more than twice the annual dividend requirements on the Class A stock.

Proceeds from the sale of the Class A stock and of 65,000 shares of common stock to be offered to stockholders at $20 a share will be used to finance the acquisition of the Acme Products Co., Inc., to retire all outstanding funded and bank indebtedness and to redeem the company's prior common stock. In addition, 186,250 shares of common stock presently will be issued in exchange for the outstanding 931,250 shares of common stock in the ratio of one share of new stock for each five shares of the outstanding common.

The pro forma consolidated balance sheet of the company, as at September 30, 1928, adjusted to give effect as at that date to the acquisition of the entire common stock of General Naval Stores Co., Inc. and of the assets of Acme Products Co., Inc., to the retirement of indebtedness as above, to the recapitalization of the Newport Co. and to other adjustments, shows current assets of $5,138,513 and current liabilities of $729,746, or net current assets of $4,408,767. Net tangible assets, after deducting all liabilities and reserves, are shown as $10,109,691, or approximately 155% of the total par value of this class A convertible stock.

Allied Tar & Chemical Co. Formed to Buy Atlantic Coal Tar Distillates

Allied Tar & Chemical Co. is organized in New York with authorized capital of 500,000 shares no par stock to take over business and assets of Atlantic Coal Tar Distillates, Inc., Bayway, Elizabeth New Jersey. Public offering of 100,000 shares of the capital stock has been made in connection with the acquisition. Officers of the company are president, Walter S. Josephson, former president and founder, Dry Ice Corp. of America; vice-president, Fred A. Haight; secretary, Albert A. Sarafan; and treasurer, David W. Blaine. Other members of the board of directors are F. G. Baumann; George C. Lewis, vice-president, L. Martin Co.; Charles Snyder; Prof. F. H. Rhoades, Cornell University; William E. Jordan, president, Wm. E. Jordan & Bros.; William J. Rose; Charles L. Huisking, president, Charles L. Huisking Co.; W. H. Windus; J. E. Clarke; Jacob A. Rappaport; Milton Hirshfeld; and Walter H. Jones.

Plant of the company at Bayway, N. J., covers 5½ acres with six additional acres owned by the company available for future expansion. As part of contemplated expansion, company plans to erect a low-temperature carbonization plant for bituminous coal. It is planned to begin construction of first unit early in 1929. Operations will proceed under charter to patent rights held by International Bitumenoil Corp., New York. Rid-O-Moth and Zulite paint are perhaps the two best-known products at present manufactured by Allied Tar & Chemical.

Of the 500,000 shares of common stock authorized, 400,000 shares are at present outstanding. Funds received from the public financing are to be used for refunding existing mortgages and to provide adequate working capital for company's needs. The following is financial statement of company upon completion of this financing:

Assets	
Cash in Bank	$ 720,000.00
Plant at Bayway-Elizabeth, N. J. at cost:	
Buildings	370,790.02
Equipment	955,655.01
Improvements not covered in above	127,434.02
To value of land of factory site 11½ acres as per appraisal	412,400.00
To ownership of Ridomoth	250,000.00
To ownership of Zulite	50,000.00
To processes, formulas, trade-mark patents and good will	700,000.00
Current Accounts receivable	25,000.00
Oil on hand and in various processes of manufacture	37,500.00
Total	$3,648,779.05
Liabilities	
To first mortgage on Company's plant	$ 135,000.00
Current accounts payable	15,000.00
Capital and surplus	3,498,799.05
Total	$3,648,779.05

Associated Rayon Corp. Organized

Associated Rayon Corp. is incorporated in Maryland with authorized capital of $40,000,000 6 per cent. cumulative convertible preferred stock and 2,000,000 no par common shares, of which $20,000,000 preferred stock and 1,2000,000 common shares are to be outstanding. It will be controlled through stock ownership by Vereinigte Glanzstoff-Fabricken, A. G., one of Germany's leading rayon producers. The company has been organized to acquire securities of companies in rayon and allied industries in the United States and abroad. Dr. F. Bluthgen, managing director, Vereinigte Glanzstoff, has been elected president of the new organization.

Financing is being handled by Speyer & Co. and Lehman Bros., New York, and by Lazard Speyer-Eiiissen K. a. A., Berlin, and Teixeira de Mattos Bros., Amsterdam.

American Solvents & Chemical Corp., in preliminary statement for twelve months ended October 31, 1928, reports net profit of $652,462 after interest, depreciation and federal taxes. These figures are tentative, being subject to audit and adjustment. In twelve months ended December 31, 1927, net profit was $317,114 after above deductions.

Westvaco Chlorine Products Corp. Offers 80,000 Shares of Common

Westvaco Chlorine Products Corp. offers November 30, at $31.50 a share, 80,000 shares of no-par common stock. The stock is part of an authorized issue of 300,000 shares, of which 200,000 will be outstanding. Company owns all capital stock of Westvaco Chlorine Products, Inc., and Warner Chemical Co.

In statement accompanying the issue, the company estimates consolidated annual sales for 1928 of $5,872,149 as compared with $4,287,682 in 1927 and $3,895,776 in 1926. Company also estimates net profits for 1928 of $628,416 available for common stock. This is equivalent to $3.14 per share on the 200,000 shares of common stock to be presently outstanding.

Consolidated balance sheet as of November 21, 1928 is as follows:

Assets

Current Assets			
Cash			$225,315.09
Call Loans			200,000.00
Accounts receivable			374,131.73
Inventories			698,638.30
Investments			97,724.00
Total Current Assets			$1,595,809.12
Deferred Assets			369,612.05
Permanent Investments			2,000.00
Plant Equipment		$6,499,712.00	
Less: Reserve for depreciation		2,599,833.33	3,899,878.67
Contracts and processes			530,018.80
Total			$6,397,318.64

Liabilities

Current Liabilities			
Accounts payable			$86,731.36
Notes payable			125,000.00
Accrued payroll			9,044.40
Total Current Liabilities			$220,775.76
Deferred Items			36,797.00
Reserve for Federal Taxes			8,691.26
Ten year note of indebtedness			22,000.00
Ten year 5½% Sinking Fund			
Gold Debentures due March 1, 1927			
Authorized		$2,500,000.00	
Redeemed		82,000.00	
Total			$2,418,000.00
Preferred stock 7% cumulative par value		$100.00	
Authorized		3,200,000.00	
Held by subsidiary	73,500.00		
Unissued	931,900.00	1,005,400.00	
Total			$2,194,600.00
Common stock (no par value)			
Authorized	300,000 shares		
Unissued	100,000 shares		
Outstanding	200,000 shares		1,496,454.62
Total			$6,397,318.64

Stockholders of Archer-Daniels-Midland Co., December 11, vote on proposed increase in authorized common stock to 750,000 shares from 350,000. Of the increase, 350,000 shares will be distributed to common stockholders as a 100% stock dividend, the remaining 50,000 shares to be held in the corporation's treasury for issuance when new capital is required.

Union Carbide & Carbon Corp. declares the regular quarterly dividend of $1.50, payable January 1 to stock of record December 7.

United States Leather Co. decares regular quarterly dividend of $1.75 on prior preference, payalle January 2, to stock of record December 10.

DuPont Declares Extra of $4.75; Proposes 3½—1 Common Split-up

E. I. du Pont de Nemours & Co. declares an extra dividend of $4.75 on the common and the regular quarterly dividends of $2.50 on the common and $1.50 on the debenture stock. The extra dividend is payable January 5 and the regular common dividend December 15, both to stock of record December 1. The debenture dividend is payable January 15 to stock of record January 10.

Directors proposed split-up in the common stock 3½ for 1 and called a meeting of stockholders for December 14 for the purpose of considering a capital readjustment plan involving a change in authorized common stock to 15,000,000 shares of $20 par value from 5,000,000 shares of no par. If this plan is approved, it is contemplated that 3½ shares of $20 par will be exchanged for each of the 2,811, 050 shares of no-par value to be outstanding at that time, including the new stock to be issued to Grasselli Chemical Co.

Directors were increased from 33 to 35 members. T. S. Grasselli, president, Grasselli Chemical Co., Cleveland, was elected to fill one of the new positions.

The finance Committee has authorized the issuance of not to exceed 149,392 shares no par common stock for acquisition of all the assets, subject to liabilities, of Grasselli Chemical Co. The shares are to be issued for the account of stockholders of Grasselli in proportion to their holdings of stock.

At market price of about 434 for du Pont common, the company paid $64,836,128 for the Grasselli company.

Penobscot Chemical Fibre Co., Boston, for the year ended March 31, 1928, reports:

Assets: Machinery, $1,460,327; merchandise, $1,029,008; notes receivable, $193,440; accounts receivable, $243,010; cash, $84,218; securities, $1,425: stocks of subsidiary companies, $1,713,900; advances to subsidiary companies, $948,262; prepaid and accrued items, $52,144; total assets, $5,725,734.

Liabilities: Preferred stock, $299,300; common stock, $250, 000; mortgages, $662,000; accounts payable, $71,046; notes payable, $49,000; reserves, $43,953; excess of assets above liabilities and preferred stocks, 20,000 shares common stock without par value outstanding, $4,350,435; total liabilities, $5,725,734.

American Glanzstoff Corp. stockholders vote to increase authorized capital stock by issuance of 150,000 new no-par Class B common shares to stockholders of record December 29 in ratio of one Class B share to every two common shares held, at $60. Offering has been underwritten by Speyer & Co., Lehman Brothers, Teixeira de Mattos Brothers, Amsterdam, and Lazard Speyer-Ellissen, K. a. A., Berlin. Rights expire January 31. Proceeds will be used to finance erection of a second unit to double the capacity of the company's rayon plant near Elizabethton, Tenn.

Report of Liquid Carbonic Corp., for year ended September 30, 1928, shows net profit of $1,230,367, after depreciation, interest, federal taxes, etc. This is equivalent to $8.25 a share earned on average number of shares outstanding during the period. Based on 174,587 shares of no-par stock outstanding at end of year, net income is equal to $7.05 a share, and compares with net income of $738,661, or $5.90 a share on 125,000 shares outstanding at end of previous fiscal year.

British Match Corp., London, controlled by Swedish Match Co., proposes to increase capital to £8,500,000, from £6,000,000, by issuing £1,500,000 5½% cumulative preference stock and £1,000,000 common. No public offering is planned but part of the issue may be offered shareholders.

Penick & Ford, Ltd., declared regular quarterly dividend of $1.75 on preferred, payable January 1 to stock of record December 14.

U. S. Industrial Alcohol Reports Gain

U. S. Industrial Alcohol Co. in report filed with New York Stock Exchange, for six months ended June 30, 1928, shows net income of $1,188,104 after charges and federal taxes.

Income account for six months ended June 30, 1928, follows: Net sales, $14,216,211; costs and expenses, $12,877,147; balance, $1,339,064; other income, $177,829; total income, $1,615,893; deductions, $166,775; federal tax reserve, $162,104; net income, $1,188,104; preferred dividends, $270,384; common dividends, $300,000; surplus, $617,720.

Directors of National Distillers Products Corp. will within the next few months give consideration to placing the 107,720 shares of preferred stock on a dividend basis. This stock, on which no dividends have been paid, becomes cumulative at rate of $7 annually, about April 1929. Although it has not been decided whether the initial dividend shall be $1.75, study is being given to the matter. It is possible the stock may be placed on $6 annual basis.

National Distillers also has outstanding 168,000 shares of no-par common. Voting trust agreement on this issue and preferred expires early in 1929.

Etablissements Kuhlmann, France, proposes to increase capital by 250,000,000 francs. New shares will be taken by the International banking group headed by Dillon, Read & Co., which participated in the previous capital increase of 25,000,000 francs.

Commercial Solvents Corp. declares the regular quarterly dividend of $2, payable January 1 to stock of record December 20.

American Solvents Declares Pref. Div.

American Solvents & Chemical Co., Chicago, declares a dividend of 75 cents on participating preferred stock, payable January 2 to stock of record December 13. Action on accrued dividends of $6 per share was deferred for future consideration.

Current assets as of September 30 exceeded current liabilities by a ratio of approximately 9 to 1, as compared with the ratio of about 2 to 1 for the same period last year. Whereas the corporation had substantial bank loans in 1927, they are entirely free of this obligation now, and have surplus cash which they are loaning out in the call market, it is stated.

Celanese Corp. of America declares the regular semi-annual dividend of $3.50 on 7% first participating preferred, payable December 31 to stock of record December 14. Directors as soon as possible after the close of the year will take action on the participating dividend to which the stock is entitled.

The regular quarterly dividend of $1.75 was declared on the 7% prior preferred, payable January 1 to stock of record December 14.

By-Products Coke Corp., Chicago, declares an extra dvidend of 75 cents and the regular quarterly dividend of 50 cents on the common. Dividends are payable December 20 to stock of record December 5.

Greene Cananea Copper Co. declares a quarterly dividend of $1.50 payable January 7, to stock of record December 13, placing stock on $6 annual basis ,against $4 previously.

Hercules Powder Co., Wilmington, declares an extra dividend of $6 and regular quarterly dividend of $2 on $100 par common stock, payable December 24 to stock of record December 13.

The Industry's Bonds

1928 Nov. 30 High	1928 Nov. 30 Low	1928 High	1928 Low	1927 High	1927 Low	Sales To Nov. 30	Sales Since Jan. 1, 1928	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
105	104½	...	...	105	99	82	2,091	Am. Agri Chem	1941	7½	F. A.	30,000
101½	101	...	...	103¼	100½	417	3,370	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
...	...	...	...	108¾	107¼		774	Am. Smelt & Refin "B" 6%	1947	6	A. O.	...
105¼	105⅛	...	...	105⅞	103⅝	1,066		Anaconda Copper Mng	1953	6	F. A.	100,000
187	180	...	...	116½	106½	3,691		Anaconda Copper Mng 7%	1938	7	F. A.	50,000
95¾	94	...	...	97	87	360	5,035	Anglo Chilean	1945	7	M. N.	16,500
102¼	101¼	...	...	103¼	100¼	100	964	Atlantic Refin	1937	5	J. J.	15,000
102	101½	...	...	102¼	100¾	16	262	By product Coke	1945	5½	M. N.	8,000
102¾	102¼	...	...	104½	101½	10	149	Corn Product Refin	1934	5	M. N.	10,000
110	109	...	...	111¼	106	104	1,528	General Asphalt	1939	6	A. O.	5,000
93½	93	...	...	91¾	81¼	12	174	Int. Agric. Corp	1932	5	M. N.	30,000
84	84	...	...	...	...	22	324	Int. Agri. Corp. stamped, extended	1942	5	M. N.	7,020
205	200	205	113	133¼	104	356	3,767	Liq. Carbonic Corp	1941	6	F. A.	5,000
122¼	122¼	122¼	100¾	102	98¼	1,543	6,899	Montecatini	1937	7		
93¼	93¼	...	...	95¾	92¼	990	2,433	Ex War	1937	7		
114	114	...	...	115	113¼	6	72	People's Gas & Coke	1943	6	A. O.	10,000
106½	105½	...	...	105¼	101¼	48	1,104	Refunding	1947	5	M. S.	40,000
103	102½	...	...	104¼	101¾	611	6,323	Standard Oil N. J.	1946	5	F. A.	120,000
116	116	...	...	101¾	98¼	123	1,017	Tenn. Cop. and Chem	1941	6	A. O.	3,000
83¼	82	...	...	95¾	91	4	91	Va. Iron C. & C.				
								NEW YORK CURB				
...	...	...	...	99¼	95¼		196	Agri. Mtge. Bk. of Col 46	1946	7	J.O.	...
...	...	...	...	99¼	96		353	Agri. Mtge. Bk. of Col.	1947	7	J.J. 15	3,000
102¼	102¼	...	...	105½	105	304	4,475	Alum. Co. of Am 52	1952	5		
...	...	...	...	101¾	99		609	Ameri :an Cyan.	1942	5	A. O.	5,000
100	99¼	...	...	102¼	101¼	134	1,217	Anaconda Cop.	1929	6	J. J.	25,000
100¼	100	...	...	99¾	95¾	361	3,559	Koppers Gas and Coke	1947	5	J. D.	25,000
100¼	100¼	...	...	103	98	64	226	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
95¾	95¼	...	...	98	95¼	178	4153	Shawinigan W & P	1967	4½		
101	100¼	...	...	100¼	100	13	61	Silica Gel	1952	6½		
98¼	98½	...	...	99¾	96	92	1,093	Solvay Am. Invest. Corp.	1942	5	M. S.	15,000
100¾	100	...	...	100¾	99	229	2,788	Swift & Co.	1932	5	A. O.	50,000
...	...	...	...	99	90		202	U. S. Ind. Alc.	1941	6½	M. N.	...
102¼	102¼	...	...	103½	98¼	70	454	Westvaco Chlorine Prod	1937	5½	M. S.	2,500
								BOSTON				
102	101¾	...	...	102¾	101	28	369	Swift and Co.	1944	5	J. J.	50,000
								CHICAGO				
102¼	102	103	101½	103¾	101¼	15	143	Swift and Co.	1944	5	J. J.	50,000
...	...	...	...	101¾	99			Westvaco Chlorine Prod	1937	5½	M. S.	2,000

Canadian Indus. Alcohol Reports Gain

Canadian Industrial Alcohol Co., for the year ending September 30, 1928, reports net profits after depreciation, taxes, etc., of $3,136,680, as compared with $2,413,996 for the preceding year. After deducting dividends of $1,614,041, there remained a surplus of $1,522,639, making total surplus of $4,656,846, as against $3,134,208 for a year ago. Balance sheet shows current assets of $8,922,799, and current liabilities of $1,223,489, indicating net working capital of $7,699,301, as compared with $4,353,444 a year ago.

Eastman Kodak Co. declares usual extra dividend of 75 cents on common and regular quarterly dividends of $1.25 on common and $1.50 on preferred. All the dividends are payable January 2 to stock of record November 30.

United States Gypsum Co. declares regular quarterly dividends of 40 cents on common and $1.75 on preferred, both payable December 31 to stock of record December 15.

Casein Co. of America declares an extra dividend of $1 and the regular quarterly dividend of $1.50, both payable November 15 to stock of record November 8.

Glidden Declares Extra of 12½ Cents

Glidden Co. declares an extra dividend of 12½ cents and a quarterly dividend of 37½ cents on the common and the regular quarterly dividend of $1.75 on the preferred, all payable January 2 to stock of record December 17. Quarterly dividend of 37½ cents on common places stock on a $1.50 annual basis. Declaration marks the resumption of dividends on common. Last previous dividend was 50 cents quarterly, which was paid April 1, 1927.

The New York Stock Exchange authorizes the listing of 80,000 additional shares of common stock (without par value) of Davison Chemical Co., on official notice of issuance in exchange for shares of stock of the Read Phosphate Co. making the total amount applied for, 480,000 shares.

The directors on June 29 authorized the issuance of 80,000 shares of common stock without par value to be exchanged for shares of stock, both common and preferred, of the Read Phosphate Co. (of West Va.). The number of shares of the Read Phosphate Co. to be acquired are 16,615, valued at $4,000,000, or $240.75 a share.

St. Louis Sulphur & Chemical Co., St. Louis, Mo., increases capital from $50,000 to $100,000.

The Industry's Stocks

1928 Nov. 30 Low	1928 Nov. 30 High	1928 High	1928 Low	1927 High	1927 Low	Sales To Nov. 30	Sales Since Jan. 1, '28	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1927	1926
								NEW YORK STOCK EXCHANGE					
84½	86⅞	...	...	199¼	134¼	77,200	612,500	Air Reduction	No	223,445	$5.00	9 mo. 12.63	10.83
239	248½	248½	146	169¼	131	126,700	2,041,500	Allied Chem. & Dye	No	2,178,109	6.00	10.02	9.79
123	123	...	...	124	120	5,500	29,170	7% pfd	100	392,849	6.00		61.28
22¼	23	...	...	21½	8½	107,600	434,320	Am. Agricultural Chem	100	333,221	2.00	Nil	...
74¼	75¼	...	...	72¼	28¼	66,300	426,220	pfd	100	284,552	1.50		3.59
108½	110½	...	...	77⅞	43⅞	1,097,000	10,838,370	American Can	25	2,473,918	2.00	4.11	4.38
141½	141½	...	...	141¾	126	3,700	43,060	pfd	100	412,333	7.00	31.66	33.31
170	170	170	56⅞	72½	20½	11,900	2,098,720	American Linseed	100	167,500	...		...
181	181	...	...	92½	46⅞	1,950	79,010	pfd	100	167,500	7.00	7 mo. 6.00	.62
56½	59¾	59¾	39	49⅞	36⅛	175,100	566,820	American Metal Ltd	No	594,278	4.00	9 mo. 3.64	3.88
116	117	...	...	113½	108	1,300	26,396	pfd	100	50,000	7.00	9 mo. 50.27	53.15
279	283	...	...	188¾	132⅞	155,300	2,717,980	Amer. Smelt and Refin	100	609,980	7.50	6 mo. 19.64	23.38
137	137¼	...	...	133	119¼	4,300	46,500	pfd	100	500,000	7.00	6 mo. 17.01	35.52
43⅜	46⅜	...	...	10¼	5⅜	95,800	1,756,700	Amer. Zinc & Lead	25	193,120	...	9 mo. Nil	...
101½	103	...	...	51¼	35	13,800	615,400	pfd	25	96,560	...	9 mo. 2 31	...
112¾	116½	116½	53¾	60½	41¼	2,757,300	10,174,420	Anaconda Copper Mining	50	3,000,000	3.00		4.74
103	104	104	55¼	63	38	133,650	510,230	Archer Dan. Mid	No	200,000	...	5.76	6.35
113½	115	...	...	112¾	106	1,270	4,500	pfd	100	43,000	7.00	37.31	35.23
92	93¼	...	...	70	56½	15,000	55,900	Atlas Powder Co	No	260,393	4.00	5.75	7.04
103¼	104	...	...	107	98	520	4,668	pfd	100	90,000	6.00	6 mo. 22.71	26.46
50	51⅞	...	...	131⅞	104	702,100	3,028,680	Atlantic Refining	100	500,000	...	9 mo. Nil	11.24
10⅝	12¼	...	...	5⅛	3¼	289,000	891,420	Butte Copper & Zinc	5	600,000	.50	9 mo. 0.09	.32
10¼	11	...	...	11¾	7⅞	58,000	459,660	Butte Superior Mng	10	290,197	2.00	9 mo. 0.23	1.71
108	110	...	...	92½	66	39,600	124,320	By Prod. Coke	No	189,931	3.00	9 mo. 4.84	6.00
3⅛	3½	...	...	2⅜	1¼	28,200	643,160	Calla Lead & Zinc	10	723,355	...	9 mo. 0.08	...
44¼	46⅞	...	...	24¼	14¼	389,700	2,308,820	Calumet & Hecla	25	2,005,502	1.50	9 mo. 0.29	.75
29¼	29⅝	...	...	55¾	42	54,300	1,040,500	Certainteed Prod	No	307,000	4.00	9 mo. 6.07	6.02
81	82	...	...	118¾	106	800		1st pfd	100	43,000	7.00	9 mo. 56.80	54.30
71¾	74⅞	74⅞	37⅞	44⅞	33½	702,700	2,578,530	Chile Copper	25	4,435,595	2.50	6 mo. 0.62	2.65
103¼	105⅞	105⅞	79	101½	66⅞	73,500	276,040	Columb Carbon	No	204,131	4.00	9.41	6.51
237½	243½	243½	137⅞	203	145	81,600	644,200	Commercial Solvents	No	108,861	4.00	9 mo. 9.24	14.13
61⅛	62½	128⅞	61⅛	86⅞	58¾	187,800	2,212,860	Cont. Can	No	620,000	6.00	7 mo. 7.54	6.36
125	127	...	...	126	120	510	2,990	pfd	100	52,930	7.00	7 mo. 86.82	70.55
91⅛	94	...	...	68	46⅞	220,600	2,052,300	Corn Products	25	2,530,000	2.00	9 mo. 4.01	4.03
143	143	...	...	142¼	128	1,740	15,960	pfd	100	250,000	7.00	9 mo. 47.62	47.73
64½	66	...	...	48½	26¼	214,000	1,851,660	Davison Chem	No	310,000	...		...
56¼	56⅜	...	...	42⅞	36⅛	44,600	382,000	Devoe & Rayn A	No	95,000	2.40	(†) 5.47	5.22
113	115½	...	...	114½	101	340	2,970	1st pfd	100	18,096	7.00	6 mo. 53.23	49.70
118¼	118¼	...	...	118	105½	7,100	55,090	Dupont deb	100	795,212	6.00	9 mo. 57.04	52.51
492	492	492	310	343⅞	168	60,700	564,860	Dupont de Nemours	No	2,661,658	9.50	15.45	13.98
186	189	...	...	175½	126¼	32,400	353,140	Eastman Kodak	No	2,055,340	5.00		9.50
126	130	...	...	131½	119¼	410	2,102	pfd	100	61,657	6.00		322.11
205	220	...	...	97	75½	6,700	15,100	Fed. Mining & Smelting	100	50,400	...	23.36	35.95
83¾	86	†...	...	71½	46⅞	318,100	3,561,720	Fleischmann	No	4,500,000	3.00	4.30	4.08
46⅝	47⅝	...	...	106½	34	109,400	3,435,520	Freeport Texas	No	729,733	4.00	9 mo. 5.24	2.48
81½	84⅜	...	...	96¾	65	161,700	1,946,200	General Asphalt	100	243,550	...	6 mo. 5.00	8.11
124	125	...	...	144⅞	107¼	6,700	57,730	pfd	100	68,742	5.00	6 mo. 4.20	27.58
132	137½	137½	71	78¾	42	917,100	4,207,220	Gold Dust	No	318,586	...	6.20	3.01
76½	77	...	...	70⅞	43¼	20,800	327,910	Household Prod	No	575,000	3.50	6 mo. 5.22	5.22
16¼	16⅞	...	...	16⅞	6⅛	37,900	324,400	Intern. Agri	No	441,695	...	Nil	1.60
82¼	82½	...	...	65	33	16,700	108,000	pfd	100	100,000	...	Nil	14.06
210½	226	226	73⅞	89½	38½	800,800	13,444,900	Intern. Nickel	25	1,673,374	2.00	9 mo. 2.26	3.00
114	120	...	...	110	103⅞	2,600		pfd	100	89,126	6.00	9 mo. 46.94	62.35
55	57½	...	...	75	63	690	12,268	Intern. Salt	100	60,771	6.00	6 mo. 2.64	8.35
182⅞	188¾	188¾	96½			397,400	2,531,260	Johns-Manseville	No	750,000		4.69	4.34
119½	124	124	63½	78⅞	45	376,500	1,034,700	Liquid Carbonic Corp	No	125,000	3.60	5.90	11.34
52⅛	52½	...	...	58½	43	13,150	58,190	Mac and Forbes	No	376,748	2.00	9 mo. 2.36	3.30
167	168	168	117¾	132¾	82	27,100	433,860	Mathieson Alk	No	147,207	6.00	9 mo. 11.27	9.88
123½	123½	...	...	120	103	200	2,405	pfd	100	24,750	7.00	9 mo. 74.06	67.85
30⅞	31⅞	31⅞	17⅞	17⅞	20⅛	221,300	730,000	Miami Copper	5	747,114	1.50		1.52

1928 Nov. 30 Low	1928 Nov. 30 High	1928 High	1928 Low	1927 High	1927 Low	Sales To Nov. 30	Sales Since Jan. 1, '28	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1927	1926
39½	42¾	...	...	56⅞	17	34,700	629,040	National Dist. Prod.	No	167,651	...	9 mo. 0.54	...
61⅛	63	...	...	69⅞	43	2,200	40,060	pfd	No	109,795	...	9 mo. 1.62	...
129	133	...	...	202¾	95	17,500	91,680	National Lead	100	206,554	8.00	10.25	35.33
...	...	...	...	139⅞	131½		11,030	pfd A	100	243,676	7.00		
...	...	...	...	116⅛	104⅞		8,060	pfd B	100	103,277	6.00		
36	36½	...	...	27⅛	19⅝	42,800	654,700	Penick & Ford	No	433,773	...	9 mo. 2.04	1.37
216	216	216	157	168¾	126	20,000	239,280	Peoples Gas Chi	100	60,000	8.00	11.15	11.04
47⅞	52⅞	52⅞	37	43⅛	36	84,900	525,600	St. Joseph Lead	10	1,951,517	2.50	1.85	4.21
55⅞	59½	59⅞	37½	41⅛	35⅛	1,236,000	5,414,320	Standard Oil Co of N. J.	25	24,262,532	1.00		5.01
40⅞	41⅛	...	...	34½	29⅞	1,236,800	6,183,980	Standard Oil Co. of N. Y.	25	17,023,928	1.60	0.90	1.9 4
17⅞	18⅞	18⅞	10½	13½	8½	200,900	924,600	Tenn. Cop. & Chem.	No	794,624	1.00		1.31
75¾	78⅛	...	...	81⅞	49	1,231,800	5,772,640	Texas Gulf Sulfur	No	2,540,000	4.00	4.76	3.69
200⅛	203½	...	...	154⅛	98⅞	347,600	3,046,500	Union Carbide	No	2,827,470	6.00	9 mo. 6.64	9.07
				10	3½			United Dyewood	100	139,183	7.00	9 mo. Nil	...
...	...	...	...	49	36½		2,830	pfd	100	39,500	...	6 mo. 2.72	3.88
127⅛	132	...	...	111⅝	69	94,000	1,307,180	U. S. Ind. Alc.	100	240,000	5.00	6.00	7.04
125½	125½	125½	118⅞	121	107½	1,650	5,920	pfd	100	60,000	7.00		35.16
19	19⅝	19⅝	12	48⅞	26⅛	45,400	237,990	Va. Car. Chem Com. 6% pfd	100	213,350	...		6.73
97⅞	97⅞	97⅞	44⅞	91	73	1,700	33,790	7% pfd	100	142,910	7.00		17.54
High	**Low**							NEW YORK CURB					
21⅞	21	...	...	31⅞	30	1,700	68,370	Acetol Prod.	No	60,000			
160	155¾	...	...	145⅛	67⅞	23,800	142,170	Aluminum Co. of America	No	1,427,625	...	4.02	...
107⅞	107	...	...	43⅛	25	500		"B"	20	263,772	1.20	3.09	3.49
21	19½	...	...	18½	3⅛	206,700	487,340	Amer. Rayon Prod.	No	110,000	1.00		Nil
46⅞	45	46⅞	25½	29	11	36,200	200,940	Amer. Solvents & Chem. pfd.	No	160,000	...		Nil
35	33½	...	...	31½	14	26,800	214,800	Anglo Chile Nitrate	No	1,756,750	...	Loss	Loss
47½	45	...	...	43½	22	1,300		Canad. Ind. Alc.	No	800,000	1.28	2.49	2.63
162	161	...	...	...	...	180		Casein Co.					
46½	42	103	42	117	44	73,400	300,640	Celanese Corp of Am	No	1,000,000	...	1.91	1.80
66	56½	...	...	129⅞	60	3,000	26,900	Celluloid Co.	100	70,980	...		...
80½	80½	...	...	133¾	113⅞	500	6,690	1st pfd	100	24,551	...		...
88⅞	88⅞	...	...	91	84	2,550	9,670	Celotex pfd	No	164,730	3.00		5.06
				126	76⅛			Chesebro Mfg Co.	25	120,000	4.00		8.06
21½	20⅝	...	...	38½	24⅞	4,100	64,220	Courtaulds	£1	12,000,000	16¼%		18.18
348	348	348	192	202	180	870	2,048	Hercules Powder	100	147,000	16.37	9 mo. 16.37	18.18
121	121	...	...	121	114	380	1,640	pfd	100	111,392	7.00	28.04	30.82
22½	20½	...	...	10	7½	1,200	20,000	Heyden Chem.	10	150,000	...		0.32
...	...	...	...	24½	4½		786,680	Indus. Rayon 'A"	No	452,544	...		2.27
...	...	...	...	39	37½	400	13,560	Monsanto Chem.	No	110,000	2.50	6.11	5.60
				194¾	178			N. J. Zinc	100	490,816	8.00	14.34	14.34
87	85	...	...	112	60⅛	1,400	92,940	Palmolive Peet	No	1,500,000	...	5.04	2.86
99	99	...	...	105½	84	425	22,105	Penn Salt.	50	150,000	5.00	8.09	6.08
7½	7	...	...	14½	8	2,900	18,480	Pyrene Mfg.	10	223,158	2%	6.42	2.38
46⅞	46	...	...	335	160	31,750	49,735	Royal Baking Powder					
...	...	...	...	110	100	350	2,400	pfd					
...	...	...	...	68⅛	44	1,475	3,850	Sherwin Williams	25	594,445	3.00	6.42	5.59
26⅞	20⅞	...	...	20⅞	13⅛	17,300	137,670	Silica Gel	No	600,000	...		...
				81½	64⅞			Standard Oil Co. of Indiana	25	9,136,618	...		6.03
...	...	...	...	12	5	3,200	14,400	Snia Viscosa	150 lire	6,666,666⅔	.72		6.86
				21	13⅞			Swan & Finch	25	34,458	.87½		...
136⅛	135½	...	...	130	115⅞	21,500	76,530	Swift & Co.	100	1,500,000	8.00	8.13	10.43
545	515½	...	...	499	145	3,710	91,508	Tubize "B"	No	78,868	...		...
75	72	...	...	110¾	82⅛	20,100	66,175	U. S. Gypsum	20	687,875	8%	10.10	11.35
...	...	...	...	77	50⅛	14,100	175,600	Wesson Oil and Snow	No	300,000	4.00	5.26	8.71
								CLEVELAND					
135	135	...	...	115	74½	425		Cleve-Cliff Iron	No	400,000	4.00		
201	200	201	112½	108	70	430		Dow Chem.	No	120,000	6.00		...
...	...	...	...	106⅛	100	20		pfd	100	30,000	7.00		...
				21⅞	15⅛			Glidden	No	400,000	2.00	3.03	3.41
104⅛	104	...	...	100	84	633		pfd	100	71,922	7.00	6 mo. 23.91	25.98
...	...	...	...	135	127	1,697		Grasselli	100	215,704	...	11.27	10.24
110	110	...	...	109½	102½	497		pfd	100	123,742	6.00		23.68
				24½	4½			Indus. Rayon "A"	No	452,544	...		2.27
88⅛	87	...	...	70	44	1,390		Sherwin Williams	25	594,445	3.00	6.42	5.59
106⅛	106⅞	...	...	109	104	673		pfd	100	125,000	6.00		...
28	28	28	24½	...	...	3,065		Wood Chemical Prod. "A"	No	20,000	2.00		...
								PITTSBURGH					
...	...	...	...	33⅛	18	200	2,576	Am. Vitrified Prod.	50	70,000	7.50	2.95	2.19
								CHICAGO					
69	67	...	...	86	53	14,500		Celotex	No	170,456	3.00	3.31	
90	89⅛	...	...	92	82	500		pfd	100	52,534	7.00		
93⅛	93	...	...	39	37	4,400		Monsanto Chem.	No	110,000	2.50	6.11	
137½	135	137½	124	130	115½	15,950		Swift & Co.	100	1,500,000	8.00	8.13	10.43
				152½	99			Union Carbide	No	2,827,470	6.00	9 mo. 6.64	9.07
77	74	...	...	110¾	82	59,400		U. S. Gypsum	20	687,875	8%	10.10	11.35
								CINCINNATI					
124⅛	124⅛	...	...	125¾	113⅛	64	396	Fleishmann pfd	100	12,295	6.00	1,589.49	1,501.80
286	282	...	...	250	177	3,159	25,826	Proc. & Gam.	20	1,250,000	4.75		9.17
								BOSTON					
...	...	...	...	17⅞	14⅛	6,513	134,479	Calumet & Hecla	25	2,005,502	1.50	9 mo. 0.29	.75
136⅛	135	136½	124½	130⅛	115	2,716	16,272	Swift & Co.	100	1,500,000	8.00	8.13	10.43
								ST. LOUIS					
...	...	...	...	...	...		337	Certainteed Prod. pfd.	100			56.80	
...	...	...	...	36	36	200	2,315	South Acid and Sulfur Co.	No	52,000	3.00		...
								PHILADELPHIA					
101	100⅛	...	...	105⅛	74½	5,500	23,190	Penn. Salt.	50	150,000	5.00	8.09	6.08
173⅛	165½	173½	114½	118½	89⅞	355,400	1,654,203	United Gas Imp.	50	2,130,088	...		4.59
								MONTREAL					
19	18	...	...	39⅛	20	...	....	Asbestos Corp.	No	200,000	1.50		1.02
...	...	...	...	98	82⅛	...	....	pfd	100	74,561	7.00		
43⅛	43	...	...	43⅛	21½	...	....	Canada. Ind. Alc.	No	(d)800,000	1.28	2.49	2.63
‡83	83	...	...	*277⅛	67	...	....	Shawinigan W. & P.	No	1,100,000	2.00	2.63	
...	...	...	...	207	142	...	....	Sherwin William of Can.	100	40,000	6.00	8.84	9.54
...	...	...	...	127	117	...	....	pfd	100	34,350	7.00		
								BALTIMORE					
...	...	...	...	39⅞	37	...		Davison Chem.	No	310,000	...		...
...	...	28½	17	20½	15	1,070	30,058	Silica Gel	No	600,000	...		...
								UNLISTED					
...	...	...	...	...	...	...	....	Casein Co.	100	21,196	7.00		7.10
74	70	...	...	...	...	...	....	Merck & Co pfd	100	33.950	4.00		7.60
...	...	...	...	...	...	...	....	Merrimac	50	70,560	...		...
...	...	...	...	...	...	...	....	Newport Chem.	1	912,198	4%		

*Old stock. † Combined A & B. (b) June 18 to Dec. 30. (d) 1927 earnings on 969,480. (e) Bid & Asked. (f) Thru Jan. 28 (g) High low.

The Trend of Prices

Heavy Chemical Sale Continues Good As Current Year Nears Conclusion

Alkali Materials, Particularly Caustic Soda Moving Well for 1929 Contract Season—Relief Seen for Tight Position of Acetate of Lime and Acetone—Mercury Position Soft—Copper Sulfate Sales Off in November—Alcohol Shipments for Anti-Freeze Moving—Methanol Position Firm.

Going into the final weeks of the current year the heavy chemical market continues to show the firm position which has characterized its movement since the early part of the year.

Based on the amount of contract business which has been placed to date, 1929 should come up to the expectations which have been predicted of it for the past several months. The present strong markets on many items marks the first time since the post war days of 1920-21 that there is enough concerted strength to the market to lend support to the contention that this is another sellers market for the first time since those immediate post war days.

There have not been any particularly noteworthy developments during the month of November, and on the whole the market has remained quite steady as to price in practically every quarter. It is true that the tight position which has ruled in many of the solvent materials has been alleviated to some extent, but producers are not yet able to fully cope with the supply and demand situation to the extent that the market could be called normal again.

The Alcohol Position

There has been no public announcement on the talked of alcohol merger, which seemed imminent at the time of going to press last month, but this announcement is expected daily and is awaited with great interest by the trade in general. In the meanwhile the alcohol market has been riding along on an even keel, with producers busy answering the call for anti-freeze business. The competition which alcohol is getting from other anti-freeze materials continues keen, as in former years, but the volume which has already been disposed of on contract to the distributors should assure the producers a fairly good season if the cold weather stays over any protracted period.

Alkali contract business continues very good at this writing and various sales departments report that not in many years has so little difficulty and pressure been exerted to get the buyers in line, particularly on caustic soda and soda ash. The situation on liquid chlorine has not righted itself by any means, but one or two producers indicate that contracts already in have come up to the estimation placed on the entire contract season for 1929. However, the position on liquid chlorine is admittedly rather easy in contrast to the strength of the remainder of this group Caustic soda, after several years of being used as something of a football by the buyers, seems at last to have come into its own with the result, as stated above, that sellers are having no trouble with 1929 contracts at the scheduled figures. Prospects of a large increase in the consumption of caustic soda in the rayon process industries has the tendency to add further strength to the market.

Benzol and Toluol Firm

Benzol, toluol and now xylol are showing very strong trends as the year nears its end. The unusual strength of toluol and xylol is caused by the strong demand from the lacquer manufacturing field for the former with the result that it has been necessary to substitute xylol for tuluol in some instances, thus causing a firm situation on both items. The December output of benzol is said to be sold up at this writing and contract writing for 1929 has been progressing very much to the sellers taste for the past several weeks.

Quicksilver and Copper Sulfate Quiet

On the other hand there are several items which have not followed the general trend of the market for the past month or two, amongst these being quicksilver, copper sulfate, imported chlorate of potash and ammonium persulfate. The sale of quicksilver during the month of November was not at all brisk as a result of which the price has dropped more than $2.00 flask during the period in all quarters. The announcement of the European sales office to control the distribution of mercury throughout the world, has not added any particular incentive to the buying on this market. In addition to this, American producers have taken advantage of the high levels which have been prevailing for the past two years and now the Western mines are producing full blast and underquoting the best imported figures in every direction. This latter fact is not condusive to a maintenance of the imported price. Copper sulfate sales fell off during November. This was something of a surprise to producers, though no alarm is expressed. October sales this year were in excess of those of 1927, and it appears that the annual Fall buying started a bit earlier. This would account for the falling off in the November demand. The demand for ammonium persulfate has fallen off to some extent, though the market is unchanged. The leading American process for this chemical has recently changed hands, the Pennsylvania Salts Company now owning the process rights.

As stated above, methanol, acetone, acetate of lime all retain the strength of the previous month. There is a bit better movement of all of these items into consuming channels, as a result of which the market may be termed not quite so tight, but the situation on each of these items will hardly be normal again until after the first of the year.

Sulfuric and acetic acids are both in rather limited supply as was the case during October. This condition is of course brought on by the good consuming demand for both, with a curtailed supply of raw materials coming at the same time.

Department of Commerce reports production of fats and oils, exclusive of refined oil and derivatives, during the three months period ended September 30 as follows: Vegetable oils, 426,345,582 pounds; fish oil, 43,784,536; animal fats, 426,972,820, and greases, 84,399,463, a total of 981,502,401 pounds. The greatest production during the period was that of lard, totaling 324,494, 084 pounds, with cottonseed oil next with 158,704,329 pounds.

Refined oils produced during the period included 107,496,257 pounds of cottonseed oil; cocoanut, 73,388,696; peanut, 2,146, 818; corn, 20,303,821; soya bean, 1,468,157, and palm kernel, 1,669,458 pounds.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

Acetone — The market has not shown any decided change over the month. The price has remained quite firm and unchanged at 15c lb. in all quarters. Stocks are in somewhat better supply at this writing.

Acid Acetic — There has not been any change in the price position since the advance of last month. While the basic position is not quite so tight, stocks are not plentiful by any means, though the supplies of raw materials are now a bit easier to obtain. Consuming demand continues to be quite brisk at the end of the month.

Acid Citric — November was accompanied by a noticeable demand for expert from some quarters. This demand tapered off toward the end of the month as foreign supplies again were able to take care of the foreign demand.

Acid Cresylic — There has been an average good movement into consuming channels during the month. There is quite a wide range in sellers ideas as to price on the pale grade with quotations heard from 70c @ 76c gal. according to seller and quantity. The dark acid is not in a firm position, and there is a tendency to shade in some quarters.

Acid Oxalic — The market is again firm in all directions following some noticeable competition in this territory for business. Leading sellers now quote 11c @ 11½c lb. and report that their output for some time ahead is spoken for, Sellers have been showing the usual steady interest for the item. For the past few months there has been another maker in the market, and this factor has been getting some business at slightly reduced figures from the levels quoted above.

Acid Sulfuric — All grades of sulfuric have continued quite firm throughout the month and sellers report that they are still having difficulty in keeping pace with the consuming demand. There has not been revision in price as a result of the firm markets, but sellers are not having any trouble in maintaining the full contract schedules.

Alcohol — November was not marked by any change in the alcohol schedule price. Some fairly cold weather during

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
......	.24	.24	.24	Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.26	.18½
.....	.20	.20	.20	Acetanilid, tech, 150 lb bbl....lb.	.23	.24	.24	.23
.....	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys..................lb.	.29	.35	.35	.29
.....	.38	.32	.37	Acetin, tech drums..........lb.				
				Acetone, CP, 700 lb drums c-1	.....	.15	.15	.13
.02½	.12	.12	.12	wks....................lb	.....	.15	.15	.13
1918	1.65	1.65	1.65	Acetone Oil, drs NY.........gal.	1.65	1.75	1.75	1.65
.....	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.42	.45	.45	.42
				Acids				
1.50	3.38	3.38	3.38	Acid Acetic, 28% 400 lb bbls c-1 wks...........100 lb.	.....	3.88	3.88	3.38
.....	11.92	11.92	11.92	Glacial, bbl c-1 wk...100 lb	.....	13.68	13.68	11.92
.....	.98	.98	.98	Anthranilic, refd, bbls......lb.	.98	1.00	'.00	.98
.....	.80	.80	.80	Technical, bbls..........lb.	.....	.80	.80	.80
1.00	1.60	1.25	1.38	Battery, cbys.........100 lb.	1.60	2.25	2.25	1.60
.23	.57	.57	.57	Benzoic, tech, 100 lb bbls...lb.	.57	.60	.60	.57
.07½	.08½	.08½	.08½	Boric, crys. powd, 250 lb bbls.................lb.	.08½	.11	.11	.08½
.....	1.25	1.25	1.25	Broenner's, bbls...........lb.	.....	1.25	1.25	1.25
1917	.85	.80	.84	Butyric, 100% basis cbys...lb.	.85	.90	.90	.85
1917	4.90	4.85	4.89	Camphoric.................lb.	.....	4.85	4.85	4.85
.....	.25	.25	.25	Carbolic, 10%, 50 gal bbls..lb.	.13	.14	.28	.13
.....	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.................lb.	.15	.16	.16	.15
1918	.37	.25	.29	Chromic, 99%, drs extra...lb.	.25	.30	.30	.25
.....	1 00	1.00	1.00	Chromotropic, 300 lb bbls..lb.	1.00	1.06	1.06	1.00
.53	.44½	.43	.43⅝	Citric, USP, crystals, 230 lb bbls...................lb.	.46	.59	.44½	.59
.....	.95	.95	.95	Cleve's, 250 lb bbls........lb.	.95	.97	.97	.95
1918	.60	.57	.61	Cresylic, 95%, dark drs NY.lb.	.70	.72	.70	.68
1918	.70	.60	.63½	97-99%, pale drs NY....lb.	.72	.77	.72	.72
1918	.11	.10	.10½	Formic, tech 85%, 140 lb cby..................lb.	.11	.12	.12	.11
1918	.50	.50	.50	Gallic, tech, bbls..........lb.	.50	.55	.55	.50
1918	.74	.69	.72	USP, bbls...............lb.	...	.74	.74	.74
.....	1.00	1.00	1.00	Gamma, 225 lb bbls wks...lb.	1.00	1.06	1.06	1.00
1918	.57	.57	.57	H, 225 lb bbls wks........lb.	.57	.63	.63	.57
.....	.67	.65	.65½	Hydriodic,USP,10%soln cbylb.	...	.67	.67	.67
.....	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks..........lb.	.45	.48	.48	.45
				Hydrochloric, CP, see Acid Muriatic................				
.....	.80	.80	.80	Hydrocyanic, cylinders wks lb.	.80	.90	.90	.80
.03	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.................lb.	.....	.06	.06	.06
.....	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.............lb	.....	.11	.11	.11
.....	.85	.85	.85	Hypophosphorous, 30%, USP demijohns............lb.	.....	.85	.85	.85
.019	.05½	05½	.05½	Lactic,22%,dark,500 lb bbls lb.	.04¾	.05½	.06	.04¾
.04	.13	.13	.13	44%, light, 500 lb bbls ...lb.	.12	.12½	.13½	.12
.....	.52	.52	.52	Laurent's, 250 lb bbls......lb.	.52	.54	.54	52
				Malic, powd., kegs........ lb	.48	.60	.60	.48
.....	.60	.60	.60	Metanilic, 250 lb bbls......lb.	.60	.65	.65	.60
1918	.07¾	.07¾	.07¾	Mixed Sulfuric-Nitric........ drs wks...........N unit	.07¾	08	.08	.07¾
1918	.01	.01	.01	drs wks...........S unit	.01	.01½	.01½	.01
.....	.21	.18	.19½	Monochloroacetic, tech bbl.lb.	.18	.21	.21	.18
.....	1.65	1.65	1.65	Monosulfonic, F Delta bbls.lb.	.....	.65	.65	.65
1.15	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks...........100 lb.	.....	1.40	1.40	1.35
1.30	1.70	1.70	1.70	20 degrees, cbys wks..100 lb.	1.70	1.80	1.80	1.70
.....	.95	.95	.95	N & W, 250 lb bbls..........	.85	.95	.95	.85
1918	.55	.55	.55	Naphthionic, tech, 250 lb1	.55	.59	.59	.55
3.37½	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks..............100 lb.	.....	5.00	5.00	5.00
4.50	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks..............100 lb.	.....	6.00	6.00	6.00
.07½	.11½	.11	.11	Oxalic, 300 lb bbls wks NY..lb.	.11	.11½	.11½	.10¾
.036	.08	.07	.07½	Phosphoric 50%, 150 lb cby.lb.	.08	.08½	.08½	.08
.23	.19	.16	.16¾	Syrupy, USP, 70 lb drs...lb	.....	.16	.16	.16
1918	.50	.50	.50	Picramic, 300 lb bbls......lb	.....	.50	.50	.50
.50	.45	.30	.41½	Picric, kegs...............lb.	.40	.50	.50	.40
.....	.86	.86	.86	Pyrogallic, technical, 200 lb bbls..................lb.	.....	.86	.86	.86
.22½	.27	.27	.27	Salicylic, tech, 125 lb bbl...lb.	.27	.32	.32	.27
1918	.15	.15	.15	Sulfanilic, 250 lb bbls......lb.	.15	.16	.16	.15
1.00	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.........100 lb.	1.60	1.95	1.95	1.60
1.00	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	.....	1.20	1.20	1.20
.87½	1.10	1.10	1.10	60°, 1500 lb dr wks..100 lb.	.....	1.12½	1.12½	1.12½
1.25	1.50	1.50	1.50	Oleum, 20%, 1500 lb drs 1c-1 wks..............100 lb.	.....	1.52½	1.52½	1.52½
.....	42.00	42.00	42.00	40%, 1c-1 wks net......ton	.....	42.00	42.00	42.00
.55	.30	.30	30	Tannic, tech, 300 lb bbls...lb.	.30	.40	.40	.30
.30½	.37	.29½	.32½	Tartaric, USP, crys, powd, 300 300 lb bbls...........lb.	.37	.38	.38	.34½
.....	.85	.85	.85	Tobias, 250 lb bbls........lb.	.....	.85	.85	.85

DIETHYLENE GLYCOL

DIETHYLENE Glycol has found extensive use in the manufacture of composition cork, as a solvent for dyes, resins and waxes and as a lubricant useful in the spinning of fiber and textiles. On nitration it yields Dinitro Diethylene Glycol which is an important explosive. It is an excellent wetting agent and for this reason has been widely used in the printing of textiles. It is a solvent for nitrocellulose and many organic liquids. It may be used in the manufacture of synthetic resins, particularly of the Glyptal type, conferring certain advantages upon resins so prepared.

These uses are merely a few of the many that have been developed during the short period of time that Diethylene Glycol has been commercially available. Undoubtedly there are still many other places in which it could be used to advantage. The cost is lower than that of competitive materials.

The properties of this interesting compound are set forth below in order that you may more intelligently determine its applicability to your problem.

Properties—Diethylene Glycol is a colorless, odorless compound, miscible in all proportions with water, alcohols, acetone, esters, ethylene dichloride, chloroform, nitrobenzene, aniline, etc. It is immiscible with ether, benzene, toluene, carbon bisulfide, carbon tetrachloride.

Boiling point, 245° @ 760 mm.
Melting point, —10.45°C
Specific gravity, 1.1212 @ 15°/15°
Specific heat, 0.555 @ 25°C
Flash point, 124°C—255.2°F
Fire point, 137°C—278.6°F
Latent heat of evaporation, 150 cal/gr. 244°C
Surface tension, 48.5 dynes per sq. cm.
Viscosity, 0.50 poises at 15°C

CARBIDE AND CARBON CHEMICALS CORPORATION

Carbide and Carbon Building

30 East Forty-second Street, New York City

UCC

Unit of Union Carbide and Carbon Corporation

Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

the month contributed to the good tone of the market by causing a better consumer demand for anti-freeze materials in many parts of the country. Aside from this point there was nothing new to the general position of the market. Producers report a firm market in all quarters with consumers taking out their commitments fully up to the expectations for the season. Nothing has been announced concerning the merger of which rumors were quite prevalent at this time last month. The rumored combine will undounbtedly be put through, but no one is prepared to state just which companies will be included in the deal.

Ammonia — Contract business over 1929 has occupied most of the sellers attention during the month. An advance of ½c lb. in the warehouse price of anhydrous grade in all sections of the country is the only change in the schedule which has prevailed for the past year. The base bulk price of 13c lb. is being maintained quite well, though spot business at the minute is not very brisk. The demand for aqua has been good throughout the month and stocks in sellers hands are not large at the moment. Sales are being made at 2½c @ 2¾c lb. in tanks, 3c @ 3½c lb. in carlot drums and 3¼c @ 3½c lb. in less carlot quantities.

Ammonia Chloride — Sales during November have shown an improvement over October. Because of the presence of imported material in the market it was necessary for domestic producers to reduce the price 10c 100 lbs., making the price in large lots $4.55 per 100 lbs., f.o.b. works. It is estimated that the sale of the white grade during 1928 will not be as great as in 1927. In one quarter it is estimated that this difference in volume might run as high as 15 per cent. This falling off in the volume is attributed to the curtailed sale to the battery trade which has been more apparent this year than last. Gray sal ammoniac has not shown any change for the month.

Ammonium Persulfate — The process rights of the leading American manufacturer has recently been disposed of to another manufacturer. What effect, if any, this move will have on the market has not been determined at this writing. At the moment the market is fairly well held at 27c @ 29c lb., though consumer demand has not been brisk of recent weeks.

Ammonium Sulfate — Large producers are practically all sold out and what material now is available on the market is resale in nature. Quotations are at $2.35 @ $2.40 per 100 lbs. in New York and $2.45 per 100 lbs. at Southern points, in a rather easy market.

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.....	2.75	2.00	2.60	Trichloroacetic, bottles.....lb.	.....	2.75	2.75	2.75
.....	2.00	2.00	2.00	Kegs..................lb.	.....	2.00	2.00	2.00
.....	1.00	1.00	1.00	Tungstic, bbls.............lb.	1.00	1.25	1.25	1.00
.19	.45	.45	.45	Albumen, blood, 225 lb bbls...lb.	.43	.47	.55	.43
.40	.95	.80	.87	Egg, edible..............lb.	.78	.83	.84	.78
.....	.92	.77	.82	Technical, 200 lb. cases..lb.	.70	.75	.80	.70
1918	.60	.60	.60	Vegetable, edible..........lb.	.60	.65	.65	.60
.....	.50	.50	.50	Technical..............lb.	.50	.55	.55	.50
				Alcohol Butyl, Normal, 50 gal				
.....	20	.19	.19½	drs c-1 wks...........lb.	.....	18.25	.20	.18½
.....	.20½	.19½	.19½	Drums, 1c-1 wks........lb.	.....	18.75	.19½	.18¾
.....	.19½	.18½	.19	Tank cars wks.........lb.	.....	17.75	.19	.17¾
.....	.....	.....	.....	Amyl (from pentane)				
.....	.....	.....	.....	drs c-1 wks.............gal.	.....	1.67	2.25	1.75
1.70	1.70	1.70	1.80	Diacetone, 50 gal drs del...gal.	1.70	1.80	1.80	1.70
				Ethyl, USP, 190 pf, 50 gal				
2.50	3.70	3.70	3.70	bbls................gal.	.....	2.69½	3.70	2.65
.....	.50	.50	.50	Anhydrous, drums........gal.	.....	.66½	.55	.50
				Completely denatured, No. 1, 190 pf, 50 gal drs drums				
1919	.52	.37½	.46	extra...............gal.	.....	.49	.52	48½
				No. 5, 188 pf, 50 gal drs.				
1918	.50	.29	.42	drums extra.........gal.	.....	.48	.50	.43
.....	.46	.25	.40	Tank, cars.............gal.	.....	.45	.46	.41
.....	1.00	1.00	1.00	Isopropyl, ref, gal drs......gal.	1.00	1.25	1.25	1.00
.....	1.00	1.00	1.00	Propyl Normal, 50 gal dr...gal.	.....	1.00	1.00	1.00
.....	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb	.80	.82	.82	.80
				Alpha-Naphthol, crude, 300 lb				
1918	.65	.65	.65	bbls...................lb.	.....	.65	.65	.65
				Alpha-Naphthylamine, 350 lb				
1917	.35	.35	.35	bbls...................lb.	.35	.37	.37	.35
				Alum Ammonia, lump, 400 lb				
1.75	3.25	3.15	3.08½	bbls, 1c-1 wks.......100 lb.	3.25	3.30	3.30	3.25
				Chrome, 500 lb casks, wks				
5.00	5.25	5.25	5.25	..................100 lb.	5.25	5.50	5.50	5.25
				Potash, lump, 400 lb casks				
4.00	3.50	3.10	3.43	wks...............100 lb.	3.10	3.20	3.20	3.10
				Chrome, 500 lb casks wks				
5.00	5.25	5.25	5.25	..................100 lb.	5.25	5.50	5.50	5.25
				Soda, ground, 400 lb bbls				
.....	3.75	3.75	3.75	wks...............100 lb.	.....	3.75	3.75	3.75
17.00	27.00	26.00	26.08	Aluminum Metal, c-1 NY.100 lb.	.....	24.30	26.00	24.30
				Chloride Anhydrous, 275 lb				
.....	.35	.35	.35	drums................lb.	.35	.40	.40	.35
				Hydrate, 96%, light, 90 lb				
.12	.17	.17	.17	bbls...................lb.	.17	.18	.18	.17
.....	.23	.23	.23	Stearate, 100 lb bbls.......lb.	.18	.22	.24	.18
				Sulfate, Iron, free, bags c-1				
1.25	1.75	1.75	1.75	wks..............100 lb.	.....	1.75	1.75	1.75
.87½	1.40	1.35	1.35½	Coml, bags c-1 wks..100 lb.	.....	1.40	1.40	1.40
.....	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs.lb.	.....	1.15	1.15	1.15
				Ammonium				
.25	.13½	.10	.10½	Ammonia, anhyd, 100 lb cyl...lb.	.13½	.14	.14	.13½
.04½	.03	.02½	.03	Water, 26°, 800 lb dr del....lb.	.....	.03½	.03	.03
				Bicarbonate, bbls., spot 100 lbs.,	6.00	6.50	.....	.....
.....	.21	.21	.21	Bifluoride, 300 lb bbls......lb.	.21	.22	.22	.21
.08	.08½	.08½	.08½	Carbonate, tech, 500 lb cs...lb.	.08½	.09	.09	.08½
				Chloride, White, 100 lb. bbls.				
6.25	5.05	4.85	5.00	wks...............100 lb.	4.65	5.15	5.15	4.65
.05½	.07	.05½	.06	Gray, 250 lb bbls wks....lb.	5.25	5.75	5.75	5.25
.10	.11	.11	.11	Lump, 500 lb cks spot....lb.	.11	.11½	.11½	.11
.....	.15	.15	.15	Lactate, 500 lb bbls.......lb.	.15	.16	.16	.15
.15	.06	.06	.06	Nitrate, tech, casks........lb.	.06	.10	.10	.06
.....	.27½	.27½	.27½	Persulfate, 112 lb kegs.....lb.	.27½	.30	.38	.27½
				Phosphate, tech, powd, 325 lb				
.....	.18	.18	.18	bbls...................lb.	.....	.18	.18	.18
2.60	2.30	2.55	2.41	Sulfate, bulk c-1.......100 lb.	2.35	2.40	2.90	2.20
2.60	2.55	2.35	2.42	Southern points.....100 lb.	.....	2.45	3.00	2.50
				Nitrate, 26% nitrogen 31.6% ammonia imported				
.....	59.70	56.85	57.56	bags..............ton	.....	60.85	60.85	60.85
.....	.55	.55	.55	Sulfocyanide, kegs.........lb.	.55	.60	.60	.55
				Amyl Acetate, (from pentane)				
1.55	2.25	1.90	2.10½	drs...................gal.	1.80	2.30	2.25	1.80
				Alcohol, see Fusel Oil..........				
.10½	.15½	.15	.15	Aniline Oil, 960 lb drs........lb.	.15½	.16½	.16½	.15½
.32	.41	.41	.41	Annatto, fine...............lb.	.41	.48	.48	.41
				Anthraquinone, sublimed, 125 lb				
.....	.90	.90	.90	bbls...................lb.	.90	1.00	1.00	.90
				Antimony, metal slabs, ton lots				
.....	.11½	.14	.12	.......................lb.	.....	.10	.12	.09½
.03½	.15½	.14	.15	Needle, powd, 100 lb cs....lb.	.....	.10	.12	.10
				Chloride, soln (butter of)				
1918	.17	.17	.17	cbys...................lb.	.17	.18	.18	.17
.06	.16½	.16½	.16½	Oxide, 500 lb bbls.........lb.	.....	.10	.12	.10
.11½	.28	.25½	.26½	Salt, 66%, tins............lb.				
.18	.20	.16	.17½	Sulfuret, golden, bbls......lb.	.16	.20	.20	.16
.15	.42	.37½	.38	Vermilion, bbls............lb.	.38	.42	.42	.38
.14	.18	.18	.18	Archil, conc, 600 lb bbls......lb.	.17	.19	.19	.17
.08	.12	.12	.12	Double, 600 lb bbls.........lb.	12	.14	.14	.12
.....	.16	.14	.15	Triple, 600 lb bbls.........lb.	.15	.16	.16	.15
.....	.15	.12½	.13½	Argols, 80%, casks..........lb.	.....	.08	.08	.08
.....	.08	.03	.06½	Coude, 30%, casks.........lb.	.15	.16	.16	.15
.05½	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs..lb.	.10½	.11	.11	.10½
.03	.04	.03½	.04	White, 112 lb kegs........lb.	.04	.04½	.04	.03½
.....	14.75	14.75	14.75	Asbestine, c-1 wks...........ton	.....	14.75	14.75	14.75
				Barium, Carbonate, 200 lb bags				
.....	47.50	47.50	47.50	wks...................ton	57.00	58.00	57.00	47.00
.13	.12	.12	.12	Chlorate, 112 lb kegs NY...lb.	.12	.12½	.12½	.12
30.00	65.00	57.50	60.70	Chloride, 800 lb bbl wks...ton	.....	35.00	65.00	54.00
1916	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.13	.13½	.13½	.13
.....	.04½	.04½	.04½	Hydrate, 500 lb bbls.......lb.	.04	.04½	.04½	.04½
.05½	.07½	.07½	.07½	Nitrate, 700 lb casks.......lb.	.07½	.08	.08	.07½
				Barytes, Floated, 350 lb bbls				
17.00	23.00	23.00	23.00	wks...................ton	23.00	24.00	24.00	23.00
.....	.....	.....	.....	Bauxite, bulk, mines.........ton	5.00	8.00	8.00	5.00
.39	.40	.37	.39	Beeswax, Yellow, crude bags..lb.	.36	.37	.38	.36
.40	.46	.38	.43	Refined, cases...........lb.	.41	.42	.43	.41

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ALTON PRODUCTS

Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

Antimony — The market has become gradually easier during the past month which has been characterized by lack of demand. It is now quiet and easy both here and in China, with a total lack of buying interest. All prices have declined so that metal, needle and oxide are all quoted at 10c lb.

Barium Chloride — The entire month of November was marked by a continued display of strength by the domestic market. At the close of the month leading American sellers were asking as high as $70.00 ton in small quantities. A lack of imported competition is still quite noticeable and while there are some sales of this latter grade, competition from this quarter is noticeably less than has been the case for many years.

Beeswax — Although conditions have not improved noticeably in this market, it is not expected that prices will go any lower as it is thought that rock-bottom has been about reached. Demand, during the past month, has been chiefly of the hand-to-mouth variety. Imports of beeswax into the United States for the first nine months of 1928 registered a decrease. The figures follow: 1927, first nine months, 4,121,000 pounds, value $1,317,000; 1928, first nine months, 3,294,000 pounds, value $1,123,000.

Benzene — Going into the month of December, leading sellers report that their output for the balance of the year is taken care of. As a result there has not been any change in the price which is firmly held at 23c gal. in tanks and ranging to 28c in smaller quantities. In view of present conditions, sellers look to 1929 to maintain the present good volume of sale.

Bleaching Powder — Buying from the textile industry is up to expectations of the sellers and they express themselves as satisfied with the volume of spot business now being transacted, though most interest centers in lining up new contract business for 1929. The spot price is at $2.00 @ $2.35 100 lbs. carlots, works and $2.15 @ $2.65 100 lbs. less carlot works.

Blood — Although the price in New York has been as high as $4.85 per unit during the past month, it is now back in the same position as when last reported, at $4.75 per unit. Chicago, however, is higher at $5.10 per unit, while South American is lower at $4.90 per unit.

Bone Meal — Is in somewhat better supply which has caused the price to decline during the past month so that quotations are now at $31.00 ton.

Calcium Acetate — Although stocks are still quite short, the market is ad-

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.47½	.58	.56	.57½	White, cases..............lb.	.56	.58	.58	.56
.....	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks..............lb.	.65	.70	.70	.65
.....	.23	.21	.22	Benzene, 90%, Commercial, 8000 gal tanks wks..........gal.	.....	.23	.23	.21
.....	.23	.21	.22½	CP, tanks works..........gal.	.....	.23	.23	.21
.....	.70	.70	.70	Benzidine Base, dry, 250 lb bbls....................lb.	.70	.74	.74	.70
.....	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs..lb.	.....	1.00	1.00	1.00
.....	.....	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25	.25
.....	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb	.24	.26	.26	.24
.....	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls..................lb.	.....	1.35	1.35	1.35
.....	.63	.63	.63	Tech, 200 lb bbls..........lb.	.63	.65	.65	.63
75.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks...ton	80.00	90.00	90.00	80.00
1.20	2.25	2.00	2.23	Bleaching Powder, 300 lb drs c-1 wks contract....100 lb.	.....	2.25	2.25	2.25
.....	2.25	2.00	2.02	700 lb drs c-1 wks contract ....100 lb.	.....	4.00	2.00	2.00
3.00	3.75	4.75	4.47½	Blood, Dried, fob, NY.....Unit	.....	4.75	5.25	4.65
.....	.....	.....	.....	Chicago.................Unit	.....	5.10	5.35	4.75
.....	.....	.....	.....	S. American shipt........Unit	.....	4.90	5.05	4.50
.27	.30	.28	.29	Blues, Bronze Chinese Milori Prussian Soluble........lb.	.31	.35	.35	.31
28.50	38.00	29.00	29.04	Bone, raw, Chicago..........ton	29.00	30.00	30.00	29.00
.....	.06	.06	.06	Bone, Ash, 100 lb kegs........lb.	.06	.07	.07	.06
.02½	.08½	.08½	.06	Black, 200 lb bbls.........lb.	.....	.08½	.08½	.08½
20.00	30.00	28.00	29.46	Meal, 3% & 50%, Imp....ton	.....	31.00	37.00	31.00
.04	.04½	.04½	.04½	Borax, crys, 500 lb bbls.......lb.	.02½	.03½	.05	.02½
.07	.11	.11	.11	Bordeaux, Mixture, 16% pwd.lb.	.10½	.12	.12	.10½
.03½	.08	.08	.08	Paste, bbls..............lb.	.08	.10	.10	.08
55.00	28.00	26.00	27.30	Brazilwood, sticks, shpmt.....lb.	26.00	28.00	28.00	26.00
1918	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20	.60
.....	.55	.55	.55	Gold, bulk................lb.	.55	1.25	1.25	.55
.....	1.60	1.42	1.52	Butyl, Acetate, normal drs 1c-1 wks..................gal.	.....	1.45	1.60	1.60
.....	1.55	1.42	1.47½	Tank, drs wks............gal.	.....	1.40	1.55	1.55
.....	1.00	1.00	1.00	Secondary, 50 gal drs.....gal.	1.00	1.05	1.05	1.00
.....	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70	.70
.....	.34	.34	.34	Propionate, drs...........lb.	.34	.36	.36	.34
.....	.60	.60	.60	Stearate, 50 gal drs.......lb.	.....	.60	.60	.60
.....	.57	.57	.57	Tartrate, drs.............lb	.57	.60	.60	.57
1918	1.50	1 35	1.4?	Cadmium, Sulfide, boxes.....lb.	1.35	2.00	2.00	1.35
				Calcium				
.....	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-1................100 lb.	.....	4.50	4.50	3.50
.....	.07½	.07½	.07½	Arsenate, 100 lb bbls c-1 wks..................lb.	.07	.09	.09	.06
.....	.05	.05	.05	Carbide, drs..............lb.	.05	.06	.06	.05
.....	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-1...................lb.	1.00	1.00	1.00	1.00
1918	27.00	27.00	27.00	Chloride, Flake, 375 lb drs c-1 wks................ton	.....	25.00	27.00	25.00
12.00	21.00	21.00	21.00	Solid, 650 lb drs c-1 fob wks ....ton	20.00	22.00	23.00	20.00
.....	52.00	52.00	52.00	Nitrate, 220 lb bbls c-1 NY.ton	.....	52.00	52.00	52.00
.....	.09	.09	.09	Phosphate, tech, 450 lb bbls.lb.	.07	.08	.08	.07
.....	.....	.....	.....	Camwood, Bark, ground bbls.lb.	.....	.18	.18	.18
.22	.33	.33	.30½	Candelilla Wax, bags........lb.	.....	.23	.28	.23
.....	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-1......................lb.	.08	.15	.15	.08
.....	.12	.12	.12	Black, 100-300 lb cases 1c-1 NY....................lb.	.....	.12	.12	.12
.06½	.05½	.05½	.05½	Bisulfide, 500 lb drs 1c-1 NY.....................lb.	.05½	06	.06	.05½
.....	.06	.06	.06	Dioxide, Liq, 20-25 lb cyl...lb.	.....	.06	.06	.06
.07½	.07	.07	.07	Tetrachloride, 1400 lb drs delivered..............lb.	.07	.07½	.07½	.07
.50	.50	.50	.50	Carnauba Wax, Flor, bags....lb	.45	.46	.58	.45
.....	.90	.54	.60½	No. 1 Yellow, bags........lb.	.40	.42	.60	.40
.32	.37	.24	.31	No. 2 N Country, bags.....lb.	.....	.34	.38	.34
.42½	.68	.48	.56	No. 2 Regular, bags.......lb.	.....	.38	.56	.38
.....	.....	.....	.....	No. 3 N. C...............lb	.....	.25	.32	.25
.....	.....	.....	.....	No. 3 Chalky ....lb.	.....	.25½	.32	.25½
.....	.18½	.15½	.17	Casein, Standard, ground.....lb.	.14½	.15	.18½	.14½
.....	.34	.26	.32½	Celluloid, Scraps, Ivory cs....lb.	.26	.30	.30	.26
.....	.18	.18	.18	Shell, cases..............lb.	.18	.20	.20	.18
.....	.34	.26	.32½	Transparent, cases........lb.	.30	.32	.32	.30
.....	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs..lb.	.....	1.40	1.40	1.40
.....	.03	.03	.03	Chalk, dropped, 175 lb bbls...lb.	.03	.03¾	.03¾	.03
.03	.02½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.....	.04½	.04½	.04½
.04	.04½	.04½	.04½	Light, 250 lb casks.........lb.	.02½	.03½	.03½	.02½
.....	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks ....bu.	.18	.19	.19	.18
1918	.06	.06	.06	Willow, powd, 100 lb bbl wks......................lb.	.06	.06½	.06½	.06
.....	.04	.04	.04	Wood, powd, 100 lb bbls....lb.	.04	.05	.05	.04
.....	.03	.02½	.03	Chestnut, clarified bbls wks,..lb.	.02½	.03	.03	.02½
.04	.02	.01½	.02	25% tks wks..............lb.	.01½	.02	.02	.01½
.....	.05½	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04 4/5	.04 4/5	.04 4/5
.....	.06½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06	.05½
8.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00	8.00
.....	.01¾	.01¾	.01¾	Powdered, bbls............lb.	.01¾	.02	.02	.01¾
.....	10.00	10.00	10.00	Pulverized, bbls wks......ton	10.00	12.00	12.00	10.00
14.00	15.00	15.00	15.00	Imported, lump, bulk. ton	15.00	25.00	25.00	15.00
.....	.03	.03	.03	Powdered, bbls...........lb	.03	.03½	.03½	.03
1918	.08	.08	.08	Chlorine, cyls 1c-1 wks contract ....lb.	.08	.09	.09	08
1917	.05½	.04	.04	Liq tank or multi-car lot cyls wks contract...........lb.	.....	.03½	.03½	.03½
1918	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks...........lb.	.....	.07	.07	.07
.19	..20	..20	..20	Chloroform, tech, 1000 lb drs..lb.	.20	.22	22	.20
....	1.00	1.00	1.00	Chloropicrin, comml, cyls....lb.	1.00	1.35	1.35	1.00

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Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

mittedly in a better position. Sellers are beginning to see their way into clearing up back orders and the movement of stocks into consumers hands is noticeably better. There has not been any change in the price which is still named at $4.50 per 100 pounds. It is expected that the market will have even further approached a normal state by the end of the year.

Calcium Chloride — There is no interest in this item at this writing and the market is routine but steady at the levels which prevailed during the summer months.

Candelilla Wax — The demand here, as in other waxes, has fallen off rapidly and quotations are now lower at 23c lb.

Carnauba Wax — Conditions existing in the market for waxes find no better illustration that in carnauba wax, where prices have declined from 2c to 7c lb. All grades have been affected by easy conditions resulting from lack of demand. Quotations are as follows: Florentine, 45c @ 46c lb.; No. 1, yellow, 40c @ 42c lb.; No. 2 N Country, 34c lb.; No. 2, regular, 38c lb.; No. 3, N Country, 25c lb.; and No. 3 chalky, 25½c lb.

Casein — Movement is purely routine in nature and prices have remained unchanged throughout the past month. Quotations are at 14½c & 15c lb., and while buyers are apparently expecting even lower prices, importers claim that the market is quite strong and that the low point has been reached.

Chlorine — There have not been any startling development in this market since our last report. Sellers are doing a fairly good contract business, in some instances it is stated that sales have been better than was expected in view of the weak condition of the market. There is not any evidence of shading for business in spite of the fact that it is known that producers are well able to more than supply the current demand for chlorine. As stated last month the new contract price for 1929 is at 3c lb. in tank cars.

Copper Sulfate — November has been a rather quiet month for copper sulfate. Sales during last month were not up to those of the same month last year which was a bit unexpected in view of the splendid manner in which the item was moving in the summer. As indicated in our last report, the higher price of copper, rather than any great demand for sulfate forced an advance in price during the month of November to $5.50 @ $5.75 100 lbs. according to quantity. It is believed that the reason for the comparatively light inquiry is due to the heavy

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.17	.27	.26	.26¾	Chrome, Green, CP lb.	.26	.29	.29	.26
.03½	.06½	.06½	.06½	Commercial lb.	.06½	.11	.11	.06½
.11	.17½	.16½	.16¾	Yellow lb.	.15½	.16½	.17	.15½
.....	.05	.04½	.04¾	Chromium, Acetate, 8% Chrome bbls lb.	.04¾	.05¾	.05¾	.04¾
1918	.05½	.05½	.05½	20° soln, 400 lb bbls lb.	.....	.05½	.05½	.05½
.....	.27	.27	.27	Fluoride, powd, 400 lb bbl lb.	.27	.28	.28	.27
.....	.34½	.34½	.34½	Oxide, green, bbls lb	.34½	.35½	.35½	.34½
.....	9.50	9.00	9.08	Coal tar, bbls bbl	9.00	9.50	9.50	9.00
1.00	2.10	2.10	2.10	Cobalt Oxide, black, bags lb.	2.10	2.22	2.22	2.10
.48	.92	.77	.85¾	Cochineal, gray or black bag lb.	.84	.87	.87	.84
.42	.92	.77	.87½	Teneriffe silver, bags lb.	.....	.86	.86	.86
13.75	13.57½	12.90	12.97	Copper, metal, electrol 100 lb.	.....	15.25	15.25	12.90
.13½	.16¾	.16½	.16½	Carbonate, 400 lb bbls lb.	.16	.17½	.17½	.16
.....	.28	.28	.28	Chloride, 250 lb bbls lb.	.....	.28	.28	.28
.....	.48	.48	.48	Cyanide, 100 lb drs lb.	.48	.50	.50	.48
.....	.16½	.16½	.16½	Oxide, red, 100 lb bbls lb.	.16½	.17	.17	.16½
.28	.18	.17	.18	Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.19	.18
4.00	5.00	4.75	4.91¾	Sulfate, bbls c-1 wks 100 lb.	....	5.50	5.50	5.05
13.00	17.00	13.00	13.33½	Copperas, crys & sugar bulk c-1 wks ton	13.00	14.00	14.00	12.00
.....	1.25	1.25	1.25	Sugar, 100 lb bbls 100 lb.	1.25	1.35	1.35	1.25
.80	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.42	.40
.....	42.00	20.00	33.75	Cottonseed, S.E. bulk c-1 ton	.....	.....	.....	.....
.....	42.00	20.00	29.85	Meal S.E. bulk ton	.....	.....	.....	.....
26.50	35.00	21.50	30.38	7% Amm., bags mills ton	37.50	38.00	38.00	36.00
.23¾	.27	.22	.24	Cream Tartar, USP, 300 lb. bbls lb.	.26	.27½	.27½	.26
.53	.40	.40	.40	Creosote, USP, 42 lb cbys lb.	.40	.42	.42	.40
1918	.20	.20	.20	Oil, Natural, 50 gal drs gal.	.17	.19	.19	.17
1918	.25	.25	.25	10-15% tar acid gal.	.21	.23	.23	.21
				25-30% tar acid gal.	.25	.28	.28	.25
1918	.17½	.17½	.17½	Cresol, USP, drums lb.	.17½	.20	.20	.17½
.07¾	.17	.16	.16½	Cudbear, English lb.	.16	.17	.17	.16
.05	.18½	.15	.18	Cutch, Rangoon, 100 lb bales lb.	.....	.18½	.18½	.18½
.....	.05	.05½	.05½	Borneo, Solid, 100 lb bale lb.	.06	.07	.07	.06
.....	1.82½	1.67½	1.78¾	Cyanamide, bulk c-1 wks Amm. lb	.....	1.70	1.75	1.67½
.....	3.92	3.77	3.84½	Dextrin, corn, 140lb. bags 100 lb.	4.77	4.97	5.12	3.77
3.00	3.87	3.72	3.78¼	White, 130 lb bgs. 100 lb.	4.72	4.92	5.07	3.72
.05½	.08½	.08½	.08½	Potato, yellow, 220 lb bgs lb.	.08	.09	.09	.08
.05½	.08½	.08½	.08½	White, 220 lb bags 1c-1 lb.	.08	.09	.09	.08
.....	.08½	.08	.08	Tapioca, 200 lb bags 1c-1 lb.	.08	.08½	.08½	.08
.....	3.80	3.80	3.80	Diaminophenol, 100 lb kegs lb.				
.....	2.95	2.85	2.93½	Diamylphthalate, drs wks gal.	.....	3.80	3.80	3.80
.....	3.25	3.25	3.25	Dianisidine, 100 lb kegs lb.	2.85	2.90	2.90	2.85
.....	.31½	.29½	.30½	Dibutylphthalate, wks lb.	.....	.26½	.28	.26½
.....	.55	.55	.55	Dibutyltartrate, 50 gal drs lb.	.29½	.31½	.31½	.29½
.....	.23	.23	.23	Dichloromethane, drs wks lb.	.55	.65	.65	.55
.....	2.15	2.15	2.15	Diethylamine, 400 lb drs lb.	.23	.25	.25	.23
.....	1.85	1.85	1.85	Diethyl carbonate, drs gal.	.....	2.15	2.15	2.15
1918	.55	.55	.55	Diethylaniline, 850 lb drs lb.	1.85	2.00	2.00	1.85
.....	.20	.20	.20	Diethyleneglycol, drs lb.	.55	.60	.60	.55
.....	.....	.....	.....	Mono ethyl ether, drs lb	.13	.15	.15	.10
.....	.....	.....	.....	Mono butyl ether, drs lb.	.25	.35	.35	.25
.....	.64	.64	.64	Diethylorthotoluidin, drs lb.	.64	.67	.67	.64
.....	.25	.25	.25	Diethyl phthalate, 1000 lb drums lb.	.24	.26	.26	.24
.....	.30	.20	.25	Diethylsulfate, technical, 50 gal drums lb.	.30	.35	.35	.30
.....	2.60	2.60	2.60	Dimethylamine, 400 lb drs lb.	.....	2.62	2.62	2.62
1918	.32	.30	.31½	Dimethylaniline, 340 lb drs lb	.30	.32	.32	.30
.....	.45	.45	.45	Dimethylsulfate, 100 lb drs lb.	.45	.50	.50	.45
1918	.15½	.15	.15½	Dinitrobenzene, 400 lb bbls lb.	.15½	.16½	.16½	.15½
.....	.18	.18	.18	Dinitrochlorine, 300 lb bbl lb.	.18	.19	.19	.18
1918	.15	.15	.15	Dinitrochlorobenzene, 400 lb. bbls lb.	.15	.16	.16	.15
1917	.32	.32	.32	Dinitronaphthalene, 350 lb bbls lb.	.32	.34	.34	.32
1918	.31	.31	.31	Dinitrophenol, 350 lb bbls lb.	.31	.32	.32	.31
1918	.18	.15	.17¾	Dinitrotoluene, 300 lb bbls lb.	.18	.19	.19	.18
.....	1.05	.85	.88	Diorthotolyguanidine, 275 lb bbls wks lb.	.48	.49	.90	.48
1918	.48	.45	.45½	Diphenylamine lb.	.45	.47	.47	.45
.....	.....	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.40	.41	.72	.40
.....	.26	.26	.26	Dip Oil, 25%, drums lb.	.26	.30	.30	.26
45.00	49.00	41.00	45.25	Divi Divi pods, bgs shipmt ton	.....	58.00	62.00	58.00
.02½	.04	.04	.04	Extract lb.	.05	.05½	.05½	.05
1918	.84	.72	.67½	Egg Yolk, 200 lb cases lb.	.80	.82	82	.73
1.00	2.00	1.75	1.87½	Epsom Salt, tech, 300 lb bbls c-1 NY 100 lb.	1.70	1.75	1.75	1.70
.22	.45	.37	.43	Esther, USP, 1880, 50 lb drs lb.	.37	.38	38	.37
.....	.90	.90	.90	Ethyl Acetate, 85% Ester, 110 gal drs gal.	1.00	1.02	1.00	.75
.....	1.10	1.03	1.08	99%, gal drums gal.	.....	1.10	1.10	1.10
.....	1.05	1.05	1.05	Benzylaniline, 300 lb drs lb.	1.05	1.11	1.11	1.05
.....	.50	.50	.50	Bromide, tech, drums lb.	.....	.70	.70	.70
.....	.22	.22	.22	Chloride, 200 lb. drums lb.	.....	.22	.22	.22
.....	3.50	3.50	3.50	Lactate, drums works lb.	.30	.35	3.50	3.50
1918	.30	.30	.30	Methyl Ketone, 50 gal drs lb.	.....	.30	.30	.30
.....	.45	.45	.45	Oxalate, drums works lb.	.45	.55	.55	.45
.....	.....	.....	.....	Oxybutyrate, 50 gal drs. wks. lb.	.30	.36	.36	.30
.....	.70	.70	.70	Ethylene Bromide, 600 lb dr lb.	.....	.70	.70	.70
.....	.75	.75	.75	Chlorhydrin, anhydrous, 50 gal drums lb.	.75	.85	.85	.75
.....	.15	.11	.11½	Dichloride, 50 gal drums lb.	.07	.10	.11	.07
.....	.30	.30	.30	Glycol, 50 gal drs wks lb.	.27	.30	.40	.25
.....	.....	.....	.....	Mono Butyl Ether drs. wks.	.27	.31	.27	.31
.....	.....	.....	.....	Mono Ethyl Ether drs. wks.	.20	.24	.20	.24
.....	.....	.....	.....	Mono Ethyl Ether Acetate dr. wks.	.23	.26	.23	26.
1918	.62	.62	.62	Ethylidenaniline lb.	.62	.65	.65	.62
8.00	20.00	20.00	20.00	Feldspar, bulk ton	20.00	25.00	25.00	20.00
.....	15.00	15.00	15.00	Powdered, bulk works ton	15.00	21.00	21.00	15.00
.....	.07½	.07½	.97½	Ferric Chloride, tech, crystal 475 lb bbls lb.	..07½	.09	.09	.07½

News ISCO CHEMICALS Notes

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1816 DECEMBER, 1928 1928

After 117 years of serving American Industry with Industrial Chemicals, Innis Speiden & Co. with their staff of forward looking Executives, salesmen and production men are projecting another hundred years of useful endeavor for the company. They are keenly conscious of that newer spirit of cooperation among business men which makes for better business and more stable conditions.

No one wants a boom with its subsequent sharp reactions. More healthy by far is the continued slow but sure growth of the Nation's business, due to natural causes. Those who conscienciously devote their lives to an industry are entitled to reap the benefits of its healthy growth. Our New Year's wish to all associates in American business is that each individual shall receive in proportion to his endeavor and enterprize, his share of happiness and prosperity.

Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

demand in October, which unlike November, was ahead of November 1927 in point of sales and which sellers take to mean that buying is being done earlier this year than last, accounting for the discrepancy from 1927.

Dextrin — No lower prices have developed and the grain market is apparently in strong position once more. As a result prices on corn dextrin remain unchanged, despite the fact that demand is in no sense overwhelming. Other dextrins are also unchanged in price and in routine demand.

Egg Yolk — Has increased 5c lb. since last reported and is now quoted at 80c @ 82c lb. in an exceedingly strong market. The Chinese plants have closed down for the Winter season and production will not be resumed until Spring. This happens every year but this year there are apparently no surplus stocks to supply the demand during the non-producing season. According to reports from China, there are no supplies left there, and factors in this country report that there is but little here and certainly not a sufficient quantity to supply normal demand until May or June when new material will be available. As a result, the market will probably continue to go higher, even to such a point where shell eggs may replace the dried yolk for ordinary purposes. The Customs Court at New York has before it a test case involving the classification of imported egg yolk, used in large quantities in this country by bakers and confectioners. Imported in the name of the French Kreme Co., it is claimed that this egg yolk is dutiable at only six cents a pound, under paragraph 713, act of 1922. The Government is fighting to maintain the collector's rate of 18 cents a pound under the same paragraph.

Ethyl Acetate — Further continued good demand has caused a further increase in price over the month. Sales to the lacquer manufacturing field have been very good during the period under report and sellers have found it necessary to advance the inside price to $1.00 gal. in good sized quantities.

Fish Scrap — Factories, of course, have all closed down by this time and there is but little dried material available on the market. Quotations are purely nominal at $5.50 and 10 per unit. Supplies of the acid are completely exhausted so that this material is no longer in the market.

Formaldehyde — Following the advance of 1c lb. to 9½c lb. in October, the market has been riding along steadily at the quoted with the regular volume of

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
2.80	5.60	4.15	4.69	Fish Scrap, dried, wks......unit	.....	5.50&10	5.50&10	4.90&10
2.50	3.50	4.24	3.56½	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	Nom.	4.75&50	4.00&50
.40	1.10	.90	1.01½	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
.40	1.10	.85	.89	Orange, 70 lb cases........lb.	1.10	1.15	1.15	1.10
.....				Flavseed..................lb.				
.....	25.00	25.00	25.00	Fluorspar, 95%, 220 lb bags...lb.	.....	.....	.....	.....
.....	.....	.....	.....	Ex-dock...............ton	.....	.....	.....	.....
				Formaldehyde, aniline, 100 lb.	.....	25.00	25.00	25.00
.....	.39	.39	.39	drums...................lb.	.39	.42	.42	.39
.08½	.11½	.08¾	.10	USP, 400 lb bbls 1c-1 wks...lb.	.....	.09½	.09	.08¾
.....	.02½	.02½	.02½	Fossil Flour...............lb.	.02½	.04	.04	.02½
.....	15.00	15.00	15.00	Fullers Earth, bulk, mines...ton	15.00	20.00	20.00	15.00
.....	25 00	25.00	25.00	Imp, powd c-1 bags.......ton	25.00	30.00	30.00	25.00
.....	.17½	.17½	.17½	Furfural, 500 lb drums.......lb.	.17½	.19½	.19½	.17½
1.10	1.69	1.35	1.59	Fusel Oil, 10% impurities....gal.	.....	1.35	1.35	1.35
.01½	.04	.04	.04	Fustic, chips...............lb.	.04	.05	.05	.04
.....	.20	.20	.20	Crystals, 100 lb boxes......lb	.20	.22	.22	.20
.06	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	.10	.10	.09
.08	.20	.20	.20	Solid, 50 lb boxes.........lb.	.20	.23	.23	.20
12.00	30.00	30.00	30.00	Sticks...................ton	30.00	32.00	32.00	30.00
1918	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.50	.52	.52	.50
.12	.20	.20	.20	Gall Extract...............lb.	.20	.21	.21	.20
.04½	.08	.06	.....	Gambier, common 200 lb cs...lb.	.08	.09	.09	.08
1917	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.14	.14	.12
.05¾	.23	.11	.17	Singapore cubes, 150 lb bg..lb.	.11	.12	.12	.11
.....	.45	.30	.43¾	Gelatin, tech, 100 lb cases....lb.	.45	.50	.50	45
.....	3.14	3.14	3.14	Bags, c-1 NY.........100 lb.	3.14	3.24	3.24	3.14
.60	1.05	1.05	1.05	Glauber's Salt, tech, 250 lb bags c-1 wks............100 lb.	.70	1.05	1.05	.70
.....	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY....100 lb.	3.24	3.34	3.34	3.24
.....	3.14	3.14	3.14	Tanner's Special, 100 lb bags ....100 lb.	.....	3.14	3.14	3.14
.12	.20	.20	.20	Glue, medium white, bbls....lb.	.20	.24	.24	.20
.18	.22	.22	.22	Pure white, bbls..........lb.	.22	.26	.26	.22
.19¾	.29	.22	.24	Glycerin, CP, 550 lb drs.....lb.	.15½	.16	.19	.15
.19½	.25	.17	.21½	Dynamite, 100 lb drs......lb.	.13½	.14	.15	.11½
.....	.....	.....	.....	Saponification, tanks.......lb.	.08¾	.08¾	.10½	.08¾
.....	.....	.....	.....	Soap Lye, tanks...........lb.	.....	.07½	.09¾	.07¾
.....	15.00	15.00	15.00	Graphite, crude, 220 lb bgs..ton	15.00	35.00	35.00	15.00
.....	.05	.05	.05	Flake, 500 lb bbls.........lb.	.06	.09	.09	.06

Gums

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.....	.03¾	.03¾	.03¾	Gum Accroides, Red, coarse and fine 140-150 lb bags....lb.	.03¾	.04½	.04½	.03¾
.....	.06	.06	.06	Powd, 150 lb bags.. ....lb.	.06	.06½	.06½	.06
.....	.18	.18	.18	Yellow, 150-200 lb bags..lb.	.18	.20	.20	.18
.25	.40	.35	.39	Animi (Zanzibar) bean & pea 250 lb cases..........lb.	.35	.40	.40	.35
.....	.60	.50	.57½	Glassy, 250 lb cases......lb.	.50	.55	.55	.50
.05	.09	.09	.09	Asphaltum ,Barbadoes (Manjak) 200 lb bags..lb	.09	.12	.12	.09
.15	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
36.00	55.00	55.00	55.00	Gilsonite Selects, 200 lb bags ....ton	58.00	65.00	65.90	55.00
.17½	.26½	.26½	.25	Damar Batavia standard 136, lb cases..............lb.	.25½	.26	.26	.22½
.....	.10½	.07	.10	Batavia Dust, 160 lb bags..lb.	.10½	.11	.11	.10½
.....	.18½	.17½	.18½	E Seeds, 136 lb cases....lb.	.17	.17½	17½	.16
.....	.14	.09	.13	F Splinters, 136 lb cases and bags..................lb.	.13	.13½	14½	.13
.....	.34	.33½	.34	Singapore, No. 1, 224 lb caseslb.	.30	.30½	.30½	.29½
.14	.22½	.21	.22½	No. 2, 224 lb cases......lb.	.23½	.24	.24	.20
.08	.14	.11	.12	No. 3, 180 lb bags.......lb.	.13½	.14	.15	.13½
.34	.35	.30	.30	Benzoin Sumatra, U.S.P....120 lb cases..............lb.	.45	.48	.48	.33
.....	.14	.12	.13	Copal Congo, 112 lb bags, clean opaque..............lb.	.14	.15	.15	.14
.12	.08¾	.08¾	.08¾	Dark, amber............lb.	.08¾	.09	.09	.08¾
.18	.12½	.12½	.12½	Light, amber...........lb	.12½	.14	.14	.12½
.25	.35	.35	.35	Water white...........lb	.35	.36	.36	.35
				Mastic ....lb.	.63	.65	.65	.58
.15	.16	.16	.16	Manila, 180-190 lb baskets Loba A................lb.	.17	.17½	.17½	.16
.....	.15	.15	.15	Loba B................lb.	.16	.16½	.16½	.15
.....	.14½	.13	.13¾	Loba C................lb.	.14	.14½	.14	.13
.....	.16	.16	.16	Pale bold, 224 lb cs......lb.	.17	.19	.19	16
.08½	.14	.12	.13	Pale nubs..............lb	.13	.13½	.13½	.12
.....	.07½	.07½	.07½	East Indies chips, 180lb bagslb.	.10	.11	.11	.07½
.....	.....	.....	.....	Pale bold, 180 lb bags.. .lb.	.20	.21	.21	.17
.....	.17	.17	.17	Pale nubs.............lb.	.15	.16	.16	.14
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.				
.13½	.29	.25	.26½	Pale bold gen No. 1.....lb.	.22	.23	.25½	.22
.07	.19	.13	.15½	Pale gen chips spot......lb.	.14½	.15	.15	.13
.....	.14	.13	.13¾	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13
.....	.13	.12	.12¾	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.....	.13	.11	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
.50	.67½	.57	.63½	Kauri, 224-226 lb cases No. 1 ....lb.	.50	.57	.57	.50
.32	.44½	.38	.41	No. 2 fair pale..........lb.	.35	.38	.38	.35
.07½	.14½	.10	.12	Brown Chips, 224-226 lb cases...............lb.	.10	.12	.12	.10
.....	.42	.38	.40	Bush Chips, 224-226 lb cases................lb.	.38	.40	.40	.38
.....	.31½	.24½	.25	Pale Chips, 224-226 lb cases ....lb.	.24½	.26	.26	.24½
.19	.27	.25	.25	Sandarac, prime quality, 200 lb bags & 300 lb casks...lb.	.48	.50	.50	.26
1917	.12	.12	.12	Hematine crystals, 400 lb bbls.lb.	.17	.20	.20	.17
1917	.09	.09	.09	Paste, 500 bbls...........lb	.....	.11	.11	.11
.02¾	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03¾	.03¾	.03½
.....	16.00	16.00	16.00	Bark...................ton	.....	16.00	16.00	16.00
.....	.60	.45	.56	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.....	.80	.62	.72	Hexamethylenetetramine, drs.lb.	.56	.58	.56	.62
2.60	3.35	2.75	3.08	Hoof Meal, fob Chicago.....unit	.....	4.00	4.00	4.00

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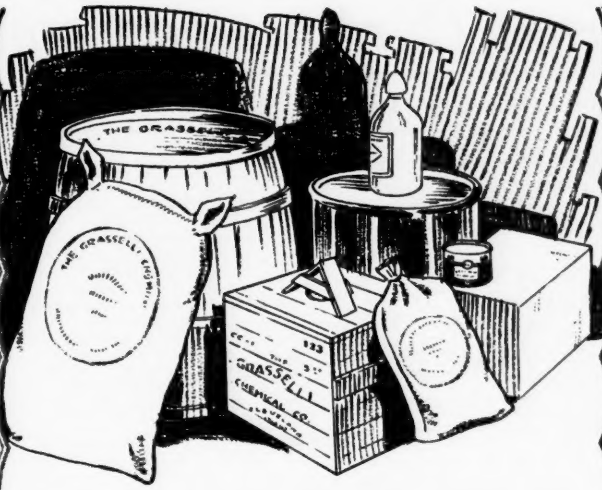

Some Grasselli Products

Acetate of Lead
Acetic Acid Commercial
Acetic Acid Glacial
Acetic Acid Pure
Acetic Acid Redistilled
Acetic Anhydride
Acid Phosphate
Aluminum Chloride Crystals
Aluminum Chloride Solution
Aluminum Sulphate Iron Free
Aqua Ammonia
Aqua Fortis
Arsenate of Lead Paste
Arsenate of Lead Powder
Arsenic Acid
Barium Chloride
Battery Coppers
Battery Zincs
Bi-Sulphate of Soda
Bi-Sulphite of Soda Solution
Black Blasting Powder
Bordeaux Mixture Powder
C. P. Ammonium Hydroxide
C. P. Hydrochloric Acid
C. P. Nitric Acid
C. P. Sulphuric Acid
Cadalyte
Cadmium
Cadmium Anodes
Cadmium Hydrate
Cadmium Sulphide
Calcium Arsenate Powder
Casein Spreader
Depilatory
Dinitrotoluol (D.N.T.)
Dust Mixtures
Dynamite (All Grades)
Electric Blasting Caps
Electrolyte
G. B. S. Soda
Glauber's Salt
Glauber's Salt Anhydrous
Hexamethalenetetramine
Hydro-sulphide of Soda
Hydro-sulphite of Soda
Hypo-sulphite of Soda Crystals
Hypo-sulphite of Soda Granulated
Hypo-sulphite of Soda Pea Crystals
Iron Ore
Iron Pyrites
Lime Sulphur Solution
Lithopone
Mixed Acid
Mossy Zinc
Muriate of Tin Crystals
Muriate of Tin Solution
Muriatic Acid
Nitre Cake
Nitric Acid Commercial
Nitric Acid Fuming
Nogas
Oil Emulsion
Oil of Vitriol
Oleum
Permissible Explosives
Phosphate of Soda
Rubber Accelerators
Salamoniac
Salt Cake
Sheradizing Zinc
Silicate of Soda Granulated
Silicate of Soda Lump
Silicate of Soda Pulverized
Silicate of Soda Solid Glass
Silicate of Soda Solution
Snowflake Soldering Salts
Sodium Acid Sulphate
Sodium Fluosilicate
Sodium Silico Fluoride
Soldering Flux Crystals
Soldering Flux Solution
Spelter
Sulphate of Soda Anhydrous
Sulphate of Soda Technical
Sulphide of Soda Concentrated
Sulphide of Soda Crystals
Sulphide of Soda Flake
Sulphide of Soda Fused Solid
Sulphite of Soda Crystal
Sulphuric Acid
Summer Fruit Spray
Super Sulphate of Soda
Thiocarbanilide
Tin Crystals
Tinning Flux
Trinitrotoluol (T.N.T.)
Tri-sodium Phosphate
Weed Killer (Poisonous)
Zinc Anodes
Zinc Chloride Fused
Zinc Chloride Granulated
Grasselli Odorless Plant Food

and many others

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Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

business being put through. As indicated at the time of the advance, the position of the market is firm and not subject to shading in any quarter.

Glauber Salts — Reports from the New England territory indicate that there is a firmer tone to the market at present This opinion is confirmed by sellers who also note a somewhat better demand from the textile industry. While it does not seem likely that they are now getting the full schedule of $1.00 per 100 lbs. for the salt, it is quite probable that the ridiculously low prices which were heard some months ago in competition with the foreign goods are no longer obtainable.

Glycerin — There has been little change in the position of any grade during the month. The mild weather has not been conducive to the heavy sale of glycerin anti-freeze preparations, and glycerin sales within the trade have not been very brisk.

Gums — Factors in this market report that the past month has been the biggest in history since the halcyon days of the war. The volume of sales has surpassed most previously existing totals and demand continues good enough to encourage the belief that December will equal, if not surpass November in volume of business. A phenomenal price advance has been evident in sandarac which has increased 8c lb. during the past month and is now quoted at 48c @ 50c lb. with the end not yet in sight. Damar Batavia standard has also advanced in price and is now quoted at 25½c @ 26c lb.

Mangrove Bark — Recent arrivals in considerable quantity have occasioned a price decline to $35.00 ton.

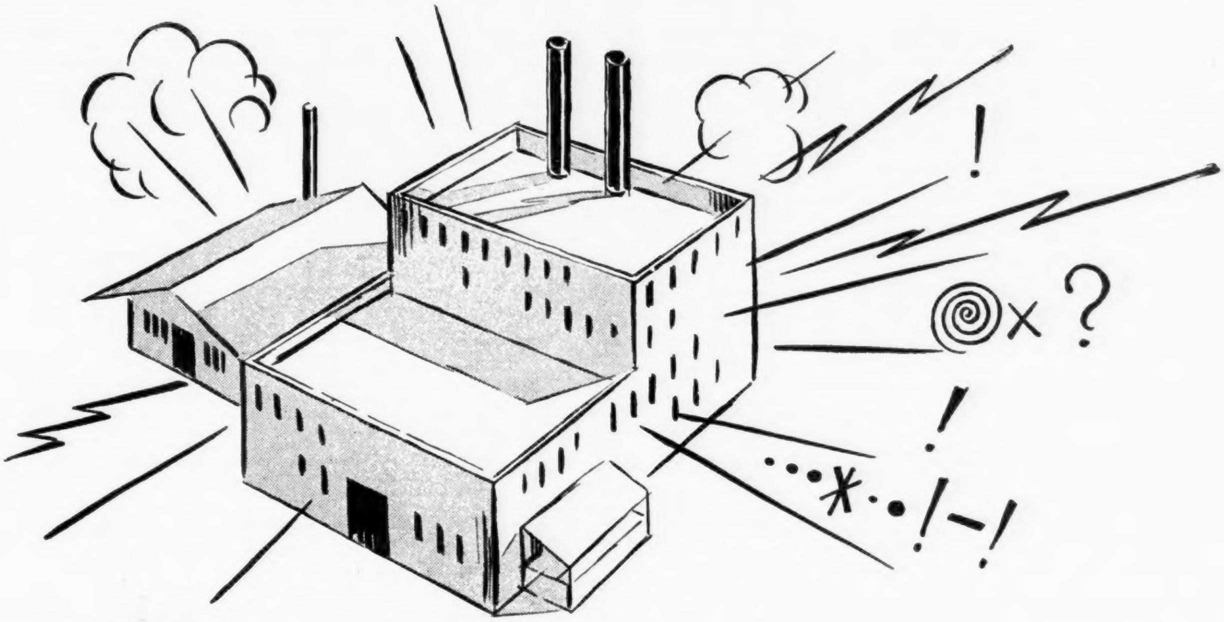
Mercury — The price of imported material was again subject to a gradual hammering down during the month with the result that the price is $2.00 flask lower at this writing than at the end of October. Quotations were heard last week at $122.00 @ $125.00 flask according to seller and quantity. The domestic mines have become quite a factor on this market with their increased output as a result of higher prices on the imported. The American producers are underquoting the importers and getting their share of what business there is. On the whole the consuming demand during November was not very brisk and a further downward revision seems likely.

Methanol — Continues as one of the finest items on the list with a good consuming demand. The prices of 60c gal. for 95% material and 66c gal. for 97% material represent another advance over

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.....	3.90	3.00	3.57	South Amer. to arrive....unit	.....	.....	.....	.....
.....	.30	.22	.24	Hydrogen Peroxide, 100 vol, 140 lb cbys..........lb.	.24	.26	.26	.24
1917	.12	.12	.12	Hpyernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
.58	1.28	1.20	1.27	Indigo Madras, bbls..........lb.	1.28	1.30	1.30	1.28
.....	.14	.14	.14	20% paste, drums..........lb.	.14	.15	.15	.14
.....	.07½	.07½	.07½	Solid, powder..........lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or Ferrous				
.04	.09	.09	.09	Iron Nitrate, kegs..........lb.	.09	.10	.10	.09
1.12½	2.50	2.50	2.50	Coml, bbls..........100 lb.	2.50	3.25	3.25	2.50
.....	.10	.10	.10	Oxide, English..........lb.	.10	.12	.12	.10
.....	.02½	.02½	.02½	Red, Spanish..........lb.	.02½	.03½	.03½	.02½
.....	.85	.85	.85	Isopropyl Acetate, 50 gal drs.gal.	.85	.90	.90	.85
.11½	.29	.17	.19	Japan Wax, 224 lb cases.....lb.	.....	.20	.20	.17
.....	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	14.00	13.00	13.33	Lead Acetate, bbls wks...100 lb.				
9.12½	14.00	13.00	13.33	White crystals, 500 lb bbls wks..........100 lb.	13.00	13.50	13.50	13.00
.04¾	.15½	.13½	.13	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
3.90	7.80	6.20	6.78	Metal, c-1 NY........100 lb.	.....	6.10	6.25	6.25
.07¾	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.17½	.17½	.17½	.17½	Oleate, bbls..........lb.	.17½	.18	.18	.17½
.....	.10¾	.08¾	.09	Oxide Litharge, 500 lb bbls..lb.	.....	.08½	.08¾	.08½
.05½	.11½	.09¾	.10	Red, 500 lb bbls wks.....lb.	.....	.09½	.09¾	09½
.05½	.09¾	.09	.09½	White, 500 lb bbls wks...lb.	.....	.09	.09	.09
.05	.09	.08½	.08¾	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08½	.08½
.....	4.50	4.50	4.50	Lime, ground stone bags....ton	.....	4.50	4.50	4.50
.....	1.05	1 05	1.05	Live, 325 lb bbls wks..100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
1918	.15	.15	.15	Lime-Sulfur soln bbls.......gal.	.15	.17	.17	.15
.03¾	.06½	.06½	.06½	Lithopone, 400 lb bbls 1c-1 wks..........lb.	.....	.06½	.06½	.06½
.05	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.01½	.03	.03	.03	Chips, 150 lb bags..........lb.	.03	.03½	.03½	.03
.06	.12	.12	.12	Solid, 50 lb boxes..........lb.	.....	.12½	.12½	.12½
15.00	26.00	26.00	26.00	Sticks..........ton	26.00	27.00	27.00	26.00
.....	.07½	.07½	.07½	Lower grades..........lb.	.07½	.08	.08	.07½
.12	.30	.30	.30	Madder, Dutch..........lb.½	.....	.30	.30	.30
30.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl..ton	48.00	50.00	50.00	48.00

Magnesium

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
1918	.06½	.06	.06	Magnesium Carb, tech, 70 lb bags NY..........lb.	.06	.06½	.06½	.06
.....	37.00	37.00	37.00	Chloride flake, 375 lb drs c-1 wks..........ton	.....	37.00	37.00	37.00
.....	33.00	33.00	33.00	Imported shipment...ton	.....	33.00	33.00	33.00
.....	31.00	31.00	31.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
.....	.10	.10	.10	Fluosilicate, crys, 400 lb bbls wks..........lb.	.10	.10½	.10½	.10
.....	.42	.42	.42	Oxide, USP, light, 100 lb bbls..........lb.	.....	.42	.42	.42
.....	.50	.50	50	Heavy, 250 lb bbls......lb.	.....	.50	.50	.50
.....	.12½	.09¾	.11½	Silicofluoride, bbls..........lb.	.09¾	.10½	.10½	.09¾
.....	.23	.23	.23	Stearate, bbls..........lb.	.23	.25	.25	.23
.20	.24	.24	.24	Manganese Borate, 30%, 200 lb bbls..........lb.	.....	.24	.24	.24
.06	.08	.08	.08	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.....	.05	.04½	.04¾	Dioxide, tech (peroxide) drs.lb.				
				Ore, powdered or granular	.35	.40	.50	.35
.....	.03	.03	.03	75-80%, bbls..........lb.	.03	.03½	.03½	.03
.....	.04	.04	.04	80-85%, bbls..........lb.	.04	.04½	.04½	.04
.....	.05	.05	.05	85-88%, bbls..........lb.	.05	.05½	.05½	.05
.....	.07	.07	.07	Sulfate, 550 lb drs NY.....lb.	.07	.07½	.07½	.07
.....	.03½	.03½	.03½	Mangrove 55%, 400 lb bbls...lb.	.03½	Nom.	Nom.	.03½
.....	39.00	34.00	37.54	Bark, African..........ton	.....	35.00	45.00	35.00
8.00	10.00	10.00	10.00	Marble Flour, bulk..........ton	10.00	12.00	12.00	10.00
1916	129.00	99.00	119.09	Mercury metal.......75 lb flask	124.00	126.00	132.00	121.00
1918	.72	.72	.72	Meta-nitro-aniline..........lb.	.72	.74	.74	.72
1918	1.70	1.70	1.70	Meta-nitro-para-toluidine 200 lb bbls..........lb.	1.50	1.55	1.80	1.50
1918	.90	.90	.90	Meta-phenylene-diamine 300 lb bbls..........lb.	.90	.94	.94	.90
1918	.72	.72	.72	Meta-toluene-diamine, 300 lb bbls..........lb.	.72	.74	.74	.72
.4	.....	.....	.....	Methanol, (Wood Alcohol), drs				
.45	.80	.55	.69	95%..........gal.	.60	.62	.58	.46
.50	.87	.57	.74½	97%, drums c-1..........gal.	.66	.68	.60	.47
.....	.....	.....	.....	Pure, drums 1c-1..........gal.	.69	.70	.63	.44
.....	.....	.....	.....	Synthetic, drums c-1......gal.	.....	.56	58	.48
.....	.80	.75	.78	Denat. grd. tanks..........gal.	.60	.62	.75	.45
.....	.95	.95	.95	Methyl Acetate, drums.....gal.	.....	.95	.95	.95
.....	.88	.75	.66	Acetone, 100 gal drums...gal.	.90	.92	.90	.68
.....	1.00	.85	.92½	Anthraquinone, kegs.......lb.	.85	.95	.95	.85
.....	.55	.55	.55	Chloride, 90 lb cyl..........gal.	.55	.60	.60	.55
.....	.03½	.03½	.03½	Mica, dry grd. bags wks......lb.	65.00	80.00	80.00	65.00
.....	.05½	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	3.00	3.00	3.00	Michler's Ketone, kegs.......lb.	....	3.00	....	....
				Monochlorobenzene, drums see, Chlorobenzene, mono......lb.				
.....	.70	.70	.70	Monoethylorthotoluidin, drs..lb.	.70	.75	.75	.70
1918	1.05	1.05	1.05	Monomethylaniline, 900 lb dr..........lb.	.....	1.05	1.05	1.05
.....	3.95	3.95	3.95	Monomethylparaminosulfate 100 lb drums..........lb.	3.95	4.20	4.20	3.95
.06½	.06½	.06½	.06½	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.....	.04	.04	.04	Myrobalans 25%, liq bbls.....lb.	.04½	.04½	.04½	.04½
.....	.08	.08	.08	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
27.00	43.50	41.00	42.00	J 1 bags..........ton	.....	43.00	50.00	42.50
27.00	37.00	23.50	35.24	J 2 bags..........ton	.....	34.00	40.00	34.00
27.00	37.00	30.00	36.62	R 2 bags..........ton	.....	34.00	40.00	34.00
.10	.21	.18	.19½	Naphtha, v. m. & p. (deodorized) bbls..........gal.	.....	.18	.18	.18



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Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

the price prevailing at the end of October. No particular change is looked for in this market for some time, though it is quite possible that the firm position may ease a bit after the turn of the year.

Methyl Acetone — Stocks are still in limited supply and while there is quite a range in the various sellers ideas as to the inside price, all report that the market is firm at the levels at which it is held. As with other items of its group, conditions are expected to become less acute after the first of the year.

Myrobalans — All grades are lower, J1 now being quoted at $43 per ton and J2 and R2 at $34 per ton.

Nitrogenous Material — Has advanced 10c per unit during the past month and is now quoted at $3.85 per unit.

Potassium Chlorate — Domestic sellers are holding firm at the level of 8½c lb. on a fairly good demand. Some business has been done on contracts over next year. The imported market is named at 7¼c @ 7½c lb. but it is stated in one quarter that this level is subject to some shading for business.

Quebracho — Demand, which is fairly good throughout the year, has increased appreciably during the past month, and as a result, 35 per cent. liquid and bleaching have advanced ¼c lb. Solid 63 per cent. and clarified 64 per cent. are selling steadily at former price levels.

Rosins — Demand has been good and the price trend distinctly upwards during the past month. All grades are from 30c to 80c per unit higher than when last quoted and the outlook is for the market to continue its upward trend throughout the present month.

Shellac — Although the market has been very quiet, with lack of demand noticeable throughout the past month, prices on bone dry and superfine have advanced since last reported. The former is quoted at 60½c lb. and the latter at 49c @ 50c lb. but conditions are generally slow, and more so than is usual at this time of the year.

Soda Ash — Sellers are bending every effort to round up the few regular contract buyers who have not fallen into line at this time. A very brisk contract business was done during the month and less difficulty was encountered in getting most contracts than in any recent year. The withdrawals on old contracts has continued good up to this date and the situation on soda ash is very satisfactory to practically every manufacturer.

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
				Naphthalene balls, 250 lb bbls				
.02¾	.06	.05½	.05¾	wks....lb.	.....	.05½	.06	.05½
.....	.04½	.04½	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.02¾	.05	.04½	.04¾	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.....	.21	.21	.21	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
1918	.35	.35	.35	Oxide, 100 lb kegs NY....lb.	.35	.38	.38	.35
1918	.09	.08½	.08¾	Salt dbl, 400 lb bbls NY....lb.	.09	.09¾	.09¾	.09
1918	.08¾	.08	.08¼	Single, 400 lb bbls NY....lb.	.08¾	.09	.09	.08¾
				Nicotine, free 40%, 8 lb tins,				
.....	1.25	1.10	1.24	cases....lb.	1.25	1.30	1.30	1.25
.....	1.10	1.10	1.10	Sulfate, 10 lb tins....lb.	.98½	1.20	1.20	98½
.....	13.00	13.00	13.00	Nitre Cake, 500 lb bbls....ton	13.00	14.00	14.00	13.00
				Nitrobenzene, redistilled, 1000				
.06½	.10½	.09½	.09½	lb drs wks....lb.	.10½	.10½	.10½	.10½
				Nitrocellulose, regular drums				
.....	.40	.40	.40	wks....lb.	.40	Nom.	Nom.	.40
				Low viscosity (soln only)				
.....	.55	.55	.55	Grade 1 drums, wks....lb.	.55	Nom.	Nom.	.55
.....	.50	.50	.50	Grade 2 drums, wks....lb.	.50	Nom.	Nom.	.50
3.05	3.60	3.35	3.53	Nitrogenous Material, bulk..unit	.....	3.85	4.00	3.35
1918	.25	.25	.25	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
1918	.14	.14	.14	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
.16	.25	.25	.25	Nutgalls Aleppy, bags....lb.	.25	Nom.	Nom.	.25
.15	.17	.17	.17	Chinese, bags....lb	.17	.18	.18	.17
.....	.22	.22	.22	Powdered, bags....lb	.22	.24	.24	.22
.08	.03½	.03½	.03½	Oak, tanks, wks....lb	....	.03½	.03½	.03½
.08	.04	.04	.04	23-25% liq., 600 lb bbl wk .lb.	.04	.04½	.04½	.04
.....	45.00	45.00	45.00	Oak Bark, ground....ton	45.00	50.00	50.00	45.00
.....	20.00	20.00	20.00	Whole....ton	20.00	23.00	23.00	20.00
				Orange-Mineral, 1100 lb casks				
.07½	.14½	.13	.13½	NY....lb.	.11½	12½	.13½	.13
.....	2.20	2.20	2.20	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
.....	2.50	2.35	2.36½	Orthoanisidine, 100 lb drs....lb.	2.35	2.50	2.50	2.35
.....	.50	.50	.50	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.....	.18	.18	.18	Orthocresol, drums....lb.	.18	.28	.28	.18
				Orthodichlorobenzene, 1000 lb				
1918	.06	.06	.06	drums....lb	.06	.07	.07	.06
				Orthonitrochlorobenzene, 1200				
1918	.32	.32	.32	lb drs wks....lb.	.32	.35	.35	.32
				Orthonitrotoluene, 1000 lb drs				
1918	.13	.13	.13	wks....lb.	.17	.18	.18	.17
1918	.85	.85	.85	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.90	.85
1918	.29	.25	.28	Orthotoluidine, 350 lb bbl 1c-1.lb.	.29	.31	.31	.29
				Orthonitroparachlorphenol, tins				
1918	.70	.70	.70	....lb.	.70	.75	.75	.70
.....	.16	.16	.16	Osage Orange, crystals....lb.	.16	.17	.17	.16
1918	.07	.07	.07	51 deg. liquid....lb.	.07	.07½	.07	.07
.....	.14½	.14½	.14½	Powdered, 100 lb bags....lb.	.14½	.15	.15	.14½
				Paraffin, refd, 200 lb cs slabs				
.04¾	.06½	.06½	.06½	123-127 deg. M. P....lb.	.06½	.06¾	.06¾	.06½
.05½	.07½	.07½	.07½	128-132 deg. M.P....lb.	.07½	.07¾	.07¾	.07½
.06½	.08	.08	.08	133-137 deg. M.P....lb.	.08	.08½	.08½	.08
1918	.08¾	.08¾	.08¾	138-140 deg. M.P....lb.	.08¾	.10	.10	.08¾
.....	.29	.26	.26½	Para Aldehyde, 110-55 gal drs.lb.	.20½	.23	.28	.20½
1918	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg.lb.	1.00	1.05	1.05	1.00
				Aminohydrochloride, 100 lb kegs				
.....	1.25	1.25	1.25	....lb.	1.25	1.30	1.30	1.25
.....	.15	.15	.15	Aminophenol, 100 lb kegs...lb.	.....	1.15	1.15	1.15
.....	.50	.50	.50	Chlorophenol, drums....lb.	.50	.65	.65	.50
.....	.12	.12	.12	Coumarone, 330 lb drums..lb.	.....	.....	.....	.....
.....	2.25	2.25	2.25	Cymene, refd, 110 gal dr...gal.	2.25	2.50	2.50	2.25
				Dichlorobenzene, 150 lb bbls				
1918	.17	.17	.17	wks....lb.	.17	.20	.20	.17
1918	.53	.50	.50½	Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55	.50
				Nitroaniline, 300 lb bbls wks				
1917	.52	.52	.52	....lb.	.48	.49	.49	.48
				Nitrochlorobenzene, 1200 lb drs				
.....	.32	.32	.32	wks....lb.	.....	.32	.32	.32
				Nitro-orthotoluidine, 300 lb				
1918	2.75	2.75	2.75	bbls....lb.	2.75	2.85	2.85	2.75
1918	.50	.50	.50	Nitrophenol, 185 lb bbls....lb.	.50	.55	.55	.50
				Nitrosodimethylaniline, 120 lb				
.....	.92	.92	.92	bbls....lb.	.92	.94	.94	.92
1918	.30	.25	.26	Nitrotoluene, 350 lb bbls...lb.	.....	.30	.30	.30
				Phenylenediamine, 350 lb bbls				
1918	1.20	1.15	1.18	....lb.	1.15	1.20	1.20	1.15
				Toluenesulfonamide, 175 lb				
.....	.40	.40	.40	bbls....lb.	.40	.41	.41	.40
				Toluenesulfonchloride, 410 lb				
.....	.20	.18	.19	bbls wks....lb.	.20	.22	.22	.20
1918	.45	.38	.41	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42	.40
				Paris Green, Arsenic Basis				
.11	.21	.21	.21	100 lb kegs....lb.	.....	.25	.25	.20
.....	.19	.19	.19	250 lb kegs....lb.	.....	.23	.23	.17
.12	.25	.25	.25	Persian Berry Ext., bbls....lb.	.....	.....	.....	.....
.....	.02½	.02½	.02½	Petrolatum, Green, 300 lb bbl.lb.	.02½	.03	.03	.02½
1918	.18	.16	.17	Phenol, 250-100 lb drums....lb.	.13	.20	.13	..20
				Phenyl - Alpha - Naphthylamine,				
1918	1.35	1.28	1.35	100 lb kegs....lb.	.....	1.35	1.35	1.35
45.00	9.00	8.50	8.75	Phosphate Acid, 16% blk wks.ton	.....	10.10	10.10	9.00
				Phosphate Rock, f.o.b. mines	.....	.....	.....	.....
3.00	3.00	3.00	3.00	Florida Pebblc, 68% basis..ton	3.00	3.15	3.15	3.00
2.00	3.50	3.50	3.50	70% basis....ton	3.50	3.65	3.65	3.50
.....	4.00	3.85	3.96	72% basis....ton	4.00	4.15	4.15	4.00
4.00	5.35	5.00	5.09	75-74% basis....ton	.....	5.00	5.00	5.00
4.00	5.75	5.60	5.71½	75% basis....ton	.....	5.75	5.75	5.75
5.75	6.25	6.00	6.19	77-76% basis....ton	.....	6.25	6.25	6.25
4.50	5.50	5.00	5.12½	Tennessee, 72% basis....ton	.....	5.00	5.00	5.00
				Phosphorous Oxychloride 175 lb				
.....	.35	.35	.35	cyl....lb.	.35	.40	.40	.35
.45	.65	.60	.62	Red, 110 lb cases....lb.	.60	.65	.65	.60
35	.32	.32	.32	Yellow, 110 lb cases wks.lb.	.....	.32	.32	.32
..	.46	.46	.46	Sesquisulfide, 100 lb cs....lb.	.....	.46	.46	.46
....	.35	.35	.35	Trichloride, cylinders....lb.	.....	.....	.....	.....
				Phthalic Anhydride, 100 lb bbls				
.....	.18	.18	.18	wks....lb.	.18	.20	.20	18

Pure PHTHALIC ANHYDRIDE

FOR over ten years, buyers have been accustomed to using PHTHALIC ANHYDRIDE of the highest purity by specifying "SELDEN BRAND".

Not only does "SELDEN BRAND" assure them of a product of highest purity, but it gives them PHTHALIC ANHYDRIDE in the form of natural long needle crystals --- the form which dissolves and melts most readily.

SELDEN BRAND PHTHALIC ANHYDRIDE reaches you in a new slack paper-lined barrel, containing 150 lbs. net weight, and the package is so constructed that it can be used for re-shipment.

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The SELDEN Company

PITTSBURGH, PA. U. S. A.

Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

Soda Caustic — After years of declining prices and buyers markets, caustic soda has apparently taken an upward turn and the situation now seems to be much in favor of the sellers. Sales on contract for next year, have already assured sellers of an increased production for 1929 and in addition to this there is an actual shortage of material to care for the spot requirements. Buyers are showing great interest in talking purchases this year with the result that contracts are taken more readily than has been the case for years.

Caustic soda exports from the United States the first nine months of this year have already almost equaled those for the entire year 1927, according to the Department of Commerce.

Exports for the period are valued at $2,550,000, compared with a valuation of $2,994,982, according to the chemical division of the department. At that rate the year's exports may exceed those of last year by 13 per cent.

Sodium Nitrate — Although the past month has been rather dull, prices are firm at $2.17½ per 100 lbs. for December delivery and $2.20 per 100 lbs. for January-June, 1929. The most important factor governing the future price movement of nitrate of soda is the continued strength in ocean freights all over the world. During the past month, rates on sodium nitrate from Chile have gone up about $1 per ton. It has been pointed out that with the present fixed prices in Chile, there is practically no profit left for sellers of sodium nitrate delivered at United States ports. Consequently an advance in price seems quite probable. World stocks at the end of October amounted to 1,805,050 metric tons as compared with 1,340,000 tons at the same time last year. September production totaled 259,400 metric tons, against 143,800 metric tons during the same month last year. Exports during that month were 171,800 metric tons against 205,500 metric tons last year.

Tankage — There are no supplies remaining in New York and as a result quotations are purely nominal.

Toluol — Is in a very firm position at this writing. Though the market is still quoted at the level of 40c gal. by leading producers, a sale has been reported to one consumer at about 10c gal. over this level. Stocks of toluol are very limited and in some instances consumers have taken to substituting xylol for tylol in limited percentages, with the result that there has

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
				Pigments Metallic, Red or brown				
.....	40.00	37.00	38 50	bags, bbls, Pa. wks.....ton	37.00	45.00	45.00	37.00
				Pine Oil, 55 gal drums or bbls				
1918	.63	.63	.63	Destructive dist.........lb.	.63	.64	.64	.63
.....	8.00	8.00	8.00	Prime bbls.........bbl.	8.00	10.60	10.60	8.00
.34	.70	.66	.69	Steam dist. bbls.......gal.	.....	.70	.70	.70
				Pitch Hardwood, ...				
37.50	40.00	40.00	40.00	wks..................ton	40.00	45.00	45.00	40.00
				Plaster Paris, tech, 250 lb bbls				
1.50	3.30	3.30	3.30	......................bbl.	.....	3.30	3.30	3.30
				Potash				
.04¾	.07¼	.07¼	.07¼	Potash, Caustic, wks.........lb.	.....	.07¼	.07¼	.07¼
.....	.07½	.07½	.07½	Imported casks c-1......lb.	.....	.07½	.07½	.07½
				Potash Salts, Rough Kainit				
8.36	9.00	9.00	9.00	12.4% basis bulk.......ton	.....	9.00	9.00	9.00
.....	9.50	9.50	9.50	14% basis............ton	.....	9.50	9.50	9.50
				Manure Salts.................				
13.58	12.40	12.40	12.40	20% basis bulk.........ton	.....	12.40	12.40	12.40
.....	18.75	18.75	18.75	30% basis bulk ....ton	.....	18.75	18.75	18.75
				Potassium Muriate, 80% basis				
39.07	36.40	36.40	36.40	bags..................ton	.....	36.40	36.40	36.40
				Pot. & Mag. Sulfate, 40% basis				
25.04	27.00	27.00	27.00	bags..................ton	.....	27.00	27.00	27.00
				Potassium Sulfate, 90% basis				
47.57	47 30	47.30	47.30	bags..................ton	.....	47.30	47.30	47.30
				Potassium Bicarbonate, USP, 320				
.08	.09	.09	.09	lb bbls................lb.	.09	.09½	.09½	.09
				Bichromate Crystals, 725 lb				
.06¾	.08½	.08	.08½	casks..................lb.	.09	.09½	.09½	.08½
.....	.12	.11	.11	Powd., 725 lb cks wks....lb.	.12¾	.13	.12¾	.12
.....	.16	.16	.16	Binoxiate, 300 lb bbls.....lb..	.16	.17	.17	.16
.....	.30	.30	.30	Bisulfate, 100 lb kegs......lb.	.....	.30	.30	.30
				Carbonate, 80-85% calc. 800				
.03⅜	.05⅜	.05⅜	.05⅜	lb casks..............lb.	.05⅜	.05¼	.05¾	.05⅜
				Chlorate crystals, powder 112				
.07½	.08½	.08½	.08½	lb keg wks...........lb.	.07½	.08	.09	.06½
				Potassium Chlorate, Imp 112 lb				
.....	.08¾	.08½	.08½	kegs NY.............lb.	.07½	.08½	.08½	.07½
	.05¼	.05¼	.05¼	Chloride, crys bbls........lb.	.05⅜	.05½	.05½	.05⅜
.....	.27	.27	.27	Chromate, kegs...........lb.	.27	.28	.28	.27
.20	.55	.55	.55	Cyanide, 110 lb. cases .....lb.	.55	.57½	.57½	.55
.13	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl..lb.	.11½	.12	.12	.11½
.14	.16	.16	.16	Oxalate. Neut. 225 lb. bbls.lb.	.16	.17	.17	.16
.....	.11	.11	.11	Perchlorate, casks wks.....lb.	.11	.12	.12	.11
				Permanganate, USP, crys 500				
.09¾	.15½	.14½	.14½	& 100 lb drs wks........lb.	.15	.15½	.15½	.15
.21	.39	.37½	.38	Prussiate, red, 112 lb keg...lb.	.37	.38	.38	.37
.12½	.18	.18	.18	Yellow, 500 lb casks.....lb.	.18	.18½	.18½	.18
.....	.51	.51	.51	Tartrate Neut, 100 lb keg...lb.	.....	.51	.51	.51
				Titanium Oxalate, 200 lb bbls				
.....	.25	.25	.25	.......................lb.	.....	.25	.25	25
.....	.04	.04	.04	Pumice Stone, lump bags.....lb.	.04	.05	.05	.04
.04½	.04½	.04½	.04½	250 lb bbls.............lb.	.04½	.06	.06	.04½
.01½	.02½	.02½	.02½	Powdered, 350 lb bags.....lb.	.02½	.03	.03	.02½
2.65	3.75	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03¼	.03¼	.03¼
4.25	5.50	5.50	5.50	Linseed Oil, kegs......100 lb.	.....	.05½	.05½	.05½
.....	3.00	1.50	.94	Pyridine, 50 gal drums......gal.	.....	1.50	1.50	1.50
				Pyrites, Spanish cif Atlantic				
.10½	.13	.12	.12½	ports bulk.............unit	.13	.13¾	.13¾	.13
.02¾	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04	.03
.....	.03½	.03½	.03½	450 lb bbls c-1..........lb.	.03¾	.04½	.04½	.03½
.....	.04	.04	.04	35% Bleaching, 450 lb bbl..lb.	.04½	.05½	.05½	.04
.04¾	.05	.04¾	.04¾	Solid, 63%, 100 lb bales cif.lb.	.05½	.05¾	.05¾	.05
.....	.05	.05	.05	Clarified, 64%, bales.....lb.	.....	.05⅜	.05⅜	.05
				Quercitron, 51 deg liquid 450 lb				
.01¾	.06½	.06½	.06½	bbls..................lb.	.05½	.06	.06	.05½
.02¾	.10	.10	.10	Solid, 100 lb boxes........lb.	.10	.13	.13	.10
22.00	14.00	14.00	14.00	Bark, Rough...........ton	.....	14.00	14.00	14.00
.....	34.00	34.00	34.00	Ground...............ton	34.00	35.00	35.00	34.00
1918	.45	.45	.45	R Salt, 250 lb bbls wks.......lb.	.45	.46	.46	.45
.03	.18	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.....	.....	.....
1918	1.25	1.25	1.25	Resorcinol Tech, cans.......lb.	1.25	1.35	1.35	1.25
				Rosin Oil, 50 gal bbls, first run				
.27	.67	.57	.59	......................gal.	.....	.57	.57	.57
.38	.72	.62	.64	Second run............gal.	.....	.62	.62	.62
				Rosins, 600 lb bbls 280 lb...unit				
4.37½	13.00	8.50	10.08½	B......................	.....	9.60	9.75	8.20
4.42½	13.00	8.50	10.17	D......................	.....	9.63	9.80	8.25
4.42½	13.15	8.50	10.23	E......................	.....	9.63	9.95	8.60
4.47½	13.20	8.50	10.49	F......................	.....	9.68	10.10	8.65
4.47½	13.25	8.50	10.58½	G......................	.....	9.68	10.10	8.75
4.47½	13.30	8.50	10.65	H......................	.....	9.75	10.10	8.75
4.55	13.35	8.55	10.79½	I......................	.....	9.75	10.15	8.80
4.49½	14.80	8.65	11.05	K......................	.....	9.85	10.15	8.85
5.47½	15.00	8.80	11.15½	M......................	.....	10.05	10.30	8.85
6.12½	15.85	9.15	11.62	N......................	.....	10.35	11.00	9.15
6.67½	16.60	10.50	12.58	WG......................	.....	11.45	11.65	10.15
6.92½	18.55	12 00	14.34	WW......................	.....	12.30	12.65	10.40
.....	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.....	.07	.07	.07	Lump, imported, bbls. ....lb.	.07	.08	.08	.07
.05½	.09	.09	.09	Selected bbls..........lb.	.09	.12	.12	.09
.02½	.02	.02	.02	Powdered, bbls..........lb.	.02	.05	.05	.02
.02¾	.04½	.04½	.04½	Sago Flour, 150 lb bags......lb.	.04½	.05	.05	.04½
.60	.90	.90	.90	Sal Soda, bbls wks.......100 lb.	.....	.....	.....	.....
11.00	19.00	19.00	19.00	Salt Cake, 94-96% c-1 wks...ton	19.00	20.00	20.00	19.00
8.00	15.00	15.00	15.00	White, 87% wks.......ton	15.00	17.00	17.00	15.00
				Saltpetre, double refd granular				
.04¾	.06½	.06½	.06½	450-500 lb bbls..........lb.	.06⅜	.06½	.06½	.06½
.....	.01½	.01½	.01½	Satin, White, 500 lb bbls.....lb.	.....	.01½	.01½	.01½
.18½	.66	.47	.57	Shellac Bone dry bbls.......lb.	.....	.60½	.62½	.49
.15	.57	.41	.48	Garnet, bags..............lb.	.....	.45	.55	.45
.14½	.65	.40	.52½	Superfine, bags............lb.	.49	.50	.58	47
.15½	.37	.57	.49	T. N. bags................lb.	.....	.45	.55	.42
1918	.50	.50	.50	Schaeffer's Salt, kegs.........lb.	.53	.57	.57	.53

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Calcium Chloride

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Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1917 71.7c - April 1928 67.8c

been a somewhat better sale of this latter item during the month.

Turpentine — Demand has increased satisfactorily during the past month and the prices are considerably higher than when last quoted, spirits being at 61c @ 66c gal. and wood distilled at 59c gal.

Valonia Beard — Is in much better supply and prices have declined accordingly. Beard is now at $58 per ton and mixture at $48 per ton. Cups is still unavailable.

Wattle Bark — The arrival of shipments in good volume has brought lower prices and quotations are now at $49.75 per ton.

OILS AND FATS

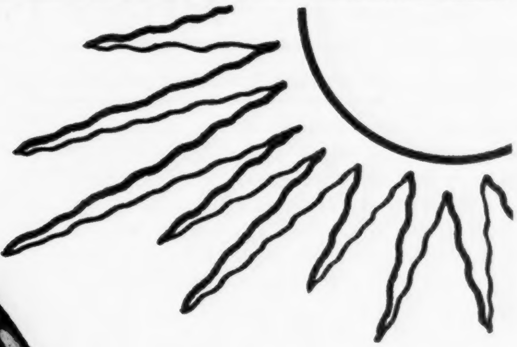
Chinawood Oil— The weakness which was apparent in the market when last reported here, has crystallized in the form of a price reduction during the past month. Barrels, New York, are now quoted at 14½c @ 15c lb., tanks at New York are again on a nominal basis, and Coast tanks are at 13½c lb. Although this represents a considerable price decline since last quoted, it does not represent the lowest point reached during the month and is somewhat of a recovery. The latest contemplated production of wood oil is reported from Northern Argentina where climate and soil are said to be favorable. Alfred Grisar Co., Ltd., London, is the organization which is considering the possibilitites of producing the trees.

Coconut Oil — All grades have moved into stronger position during the past month and the situation at nearby points is said to be tight. All grades have advanced in price, Ceylon and Manila about ⅛c @ ¼c lb., and Cochin about ¼c @ ½c lb., in a firm market with better demand.

Corn Oil — As the grain market is again stronger and cottonseed oil higher, corn oil has also moved into stronger and higher position. Crude oil in barrels is now at 10¾c lb., while the tank price is at 8¾c lb.

Cottonseed Oil — Has shown a marked upward price tendency during the past month and is now over ½c lb. higher in price on spot. Crude oil is at 8½c lb., PSY at 10.10c lb., while futures

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.....	6.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
.....	15.00	15.00	15.00	Refined, floated bags......ton	22.00	30.00	30.00	22.00
.....	32.00	32.00	32.00	Air floated bags........ton	.....	.....	.....	.....
.....	55.00	55.00	55.00	Extra floated bags.....ton	32.00	40.00	40.00	32.00
10.00	15.00	15.00	15.00	Soapstone, Powdered, bags f.o.b. mines................ton	15.00	22.00	22.00	15.00
				Soda				
.67½	1.32½	1.32½	1.32½	Soda Ash, 58% dense, bags c-1 wks...............100 lb.	.....	1.40	1.40	1.40
.57½	2.14	2.04	2.12	58% light, bags del NY . 100 lb.	2.04	2.29	2.29	2.04
.....	1.32½	1.32½	1.32½	Contract, bags c-1 wks. 100 lb.	.....	1.32½	1.32½	1.32½
2.50	4.16	4.06	4.14½	Soda Caustic, 76% grnd & flake drums del NY......100 lb.	4.16	4.21	4.21	4.16
.....	3.76	3.66	3.74½	76% solid drs del NY...100 lb.	3.76	3.91	3.91	3.76
.....	3.00	3.00	3.00	Contract, c-1 wks.....100 lb.	.....	3.00	3.00	3.00
.03½	.04½	.04½	.04½	Sodium Acetate, crystals, 450 lb bbls wks...............lb.	.04½	.05	.05	.04½
.....	.19	.18	.18½	Arsenate, drums.. ....lb.	.....	.....	.....	.....
.....	1.00	1.00	1.00	Arsenite, drums..........gal.	.....	.....	.....	.....
1.00	2.41	2.41	2.41	Bicarb., 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41
.04½	.06½	.06½	.06½	Bichromate, 500 lb cks wks.lb.	.07	.07½	.07	.06½
.02½	.08½	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04	.04
.60	1.30	1.30	1.30	Carb. 350 lb bbls NY...100 lb.	1.30	1.35	1.35	1.30
.07½	.06½	.06½	.06½	Chlorate, 112 lb kegs wks...lb	.06½	.07	.06½	.05½
.....	12.00	12.00	12.00	Chloride, technical.......ton	12.00	13.00	13.00	12.00
.22	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks..........lb.	.....	.20	.20	.20
1918	.08½	.08½	.08½	Fluoride, 300 lb bbls wks...lb.	.08½	.09	.09	.08½
.....	.22	.22	.22	Hydrosulfite, 200 lb bbls f.o.b. wks................lb.	.22	.24	.24	.22
.....	.05	.05	.05	Hypochloride solution, 100 lb cbys..................lb.	.....	.05	.05	.05
1.40	2.65	2.65	2.65	Hyposulfite, tech, pea crys 375 lb bbls wks....100 lb.	2.65	3.05	3.05	2.65
1.30	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks... 100 lb.	2.40	2.65	2.65	2.40
.....	.70	.45	.62	Metanilate, 150 lb bbls.....lb.	.....	.45	.45	.45
.....	.02½	.02½	.02½	Monohydrate, bbls........lb.	.....	.....	.....	.....
1918	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57	.55
2.12½	2.67	2.25	2.52½	Nitrate, 92%, crude, 200 lb bags c-1 NY......100 lb.	.....	2.17½	2.45	2.12½
.05½	.08½	.08	.08	Nitrite, 500 lb bbls spot ...lb.	.07½	.08	.08½	.07½
.....	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb	.25	.27	.27	.25
.....	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.20	.23	.23	.20
.....	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90	3.90
.....	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09	.08
.19	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.21	.22	.22	.21
2.12½	3.25	3.25	3.25	Phosphate, di-sodium, tech. 550 lb bbls.......100 lb.	3.25	3.55	3.55	3.25
.....	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72	.69
.08½	.12	.11	.12	Prussiate, Yellow, 350 lb bbl wks..................lb.	.12	.12½	.12½	.12
.....	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.13½	.14	.14	.13½
.02	1.20	1.20	1.20	Silicate, 40 deg clear 55 gal drs wks...........100 lb.	1.20	1.45	1.45	1.20
.02	.85	.85	.85	40 deg turbid 55 gal drs wks.............100 lb.	.85	1.10	1.10	.85
.....	.04½	.04½	.04½	Silicofluoride, 450 lb bbls NY ....lb.	.05	.05½	.05	.05
.....	.48½	.48½	.48½	Stannate, 100 lb drums.....lb.	.48½	.49	.49	.48½
.....	.20	.20	.20	Stearate, bbls.............lb.	.18	.22	.29	.18
.....	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18	.16
.....	.02½	.02½	.02½	Sulfate Anhyd., 550 lb bbls c-1 wks..............lb.	.02½	.02½	.02½	.02½
.01½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks............lb.	.02½	.02½	.02½	.02½
.....	.03½	.03½	.03½	62% solid, 650 lb drums lc-1 wks...............lb.	.03½	.04	.04	.03½
.02½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks..................lb.	.03½	.03½	.03½	.03½
.....	.40	.40	.40	Sulfocyanide, bbls.........lb.	.40	.50	.50	.40
.....	.85	.80	.82½	Tungstate, tech, crystals, kegs ....lb.	.80	.85	.85	.80
1917	.40	.35	.37	Solvent Naphtha, 110 gal drs wks....................gal.	.35	.40	.40	.35
1918	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½	.01½
1918	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01	.01
.....	.02	.02	.02	50% powd., 100 lb bag wks.lb.	.02	.02½	.02½	.02
.....	3.22	3.07	3.14½	Starch, powd., 140 lb bags ....100 lb.	4.07	4.27	4.42	3.07
1.99	3.12	2.97	3.03	Pearl, 140 lb bags......100 lb.	3.97	4.17	4.32	2.97
.05½	.06	.04½	.05½	Potato, 200 lb bags ....lb	.05½	.06½	.06½	.05½
.05½	.06½	.06½	.06½	Imported bags..........lb	.05½	.06½	.06½	.05½
.05½	.08	.06	.07	Soluble.................lb.	.08	.08½	.08½	.08
.07	.09½	.09	.09½	Rice, 200 lb bbls..........lb.	.09½	.10	.10	.09½
.04½	.06½	.06½	.06½	Wheat, thick bags.........lb.	.06½	.07	.07	.06½
.04½	.09½	.09½	.09½	Thin bags..............lb.	.09½	.10	.10	.09½
1918	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks...................lb	.07½	.07½	.07½	.07½
.07½	.08½	.08	.08	Nitrate, 600 lb bbls NY....lb.	.08½	.09	.09	.08½
				Sulfur				
1.85	2.05	.205	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05	2.05
.....	18.00	18.00	18.00	Crude, f.o.b. mines.... ton	18.00	19.00	19.00	18.00
.....	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY......100 lb.	.....	2.40	2.40	2.40
2.00	2.50	2.50	2.50	Heavy bags c-1......100 lb.	.....	2.50	2.50	2.50
2.20	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY................100 lb.	.....	3.45	3.45	3.45
1.85	2.65	2.65	2.65	Roll, bbls lc-1 NY.....100 lb.	2.65	2.85	2.85	2.65



You can always rely on the dependability of Diamond Alkali quality. Once you have determined the chemical reaction of Diamond Alkalies in your process, you have set a formula that can be depended upon to give identical results time after time.

Remember too, that Diamond Alkalies have a nationwide distribution comparable in every way to the quality and uniformity of Diamond Alkalies.

Diamond Alkali Company

PITTSBURGH, PENNA.
and Everywhere

Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

average about 10.25c lb. in a steady market. A cotton crop of 14,133,000 bales in 1928 is indicated by reports as of November 1, according to the Department of Agriculture. This compares with a production of 12,955,000 bales in 1927 and 17,977,000 bales in 1926. Ginnings from the 1928 crop have amounted to 11,320,302 running bales prior to November 14, against ginnings to November 14 in 1927 of 10,894,912 and in 1926 of 12,956,444.

Greases — All grades are somewhat advanced in price due to increased demand during the past month.

Linseed Oil — Quotations have been advanced .2c lb. since last reported so that prices are now as follows: tanks, 9.4c lb.; barrels, 10.2c lb.; and five-barrel lots, 10.6c lb. Trading has fallen off, however, since the advance and conditions in the market are quiet. Consumption of linseed oil in the United States in the year ended September 30, 1928, amounted to 103,922,808 gallons, or 41,569,123 bushels of flaxseed, compared with 98,168,190 gallons, or 39,267,276 bushels of seed in the year ended September 30,1927. While stocks of linseed oil on September 30 were 16,170,176 gallons, the highest on any similar date in the past seven years, the increase over September 30, 1927 was comparatively slight, stocks on that date totalling 15,628,219 gallons.

Menhaden Oil — Although it has been as high as 50c gal., is now lower, being quoted at 48c gal., or 1c gal. higher than when last reported.

Oleo Oil — All grades are from ½c lb. to 1c lb. lower than when last quoted due to rather poor demand. No. 1 is at 11¾c lb.; No. 2 at 11c lb.; and No. 3 at 10¼c lb.

Olive Oil — Denatured oil is again lower in price and is now quoted at $1.25 @ $1.32 gal. Foots is about at the same level as when last reported, being quoted at 10½c @ 10¾c lb. Supplies of the latter are said to be practically unobtainable, with no relief in sight before new crop becomes available. An advance to 11c lb. would not be improbable and most factors predict such a condition before the first of the year. As is usual about this time, reports are beginning to reach this country concerning the status of the new crop. The International Institute of Agriculture in Rome states that the forecast of olive oil pro-

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.....	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks....lb.	.05	.05½	.05½	.05
.....	.03½	.03½	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½	.03½
.....	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½	.08
.....	.17	.17	.17	Extra, dry, 100 lb cyl......lb.	.17	.19	.19	.17
.....	.65	.65	.65	Sulfuryl Chloride, 600 lb dr...lb	.10	.65	.65	.10
.....	.11	.11	.11	Stainless, 600 lb bbls.....lb.	.11	.11½	.11½	.11
.....	.05	.05	.05	Extract, 450 lb bbls.......lb.	.05½	.06	.06	.05½
.....	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00	130.00
62.00	80.00	72.00	73.75	Ground shipment.......ton	.....	72.00	72.00	72.00
40.00	55.00	55.00	55.00	Virginia, 150 lb bags......ton	55.00	60.00	60.00	55.00
.....	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY..ton	12.00	15.00	15.00	12.00
15.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00	16.00
15.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	30.00	35.00	35.00	30.00
.....	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00	38.00
35.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00	40.00
.....	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00	50.00
3.50	4.85	4.00	4.41	Tankage Ground NY.......unit	.....	4.75&10	5.10&10	4.65&10
3.10	5.25	3.75	4.29	High grade f.o.b. Chicago.unit	.....	5.00&10	4.25&10	3.90&10
.....	5.25	4.00	4.38½	South American cif.......unit	.....	5.00&10	5.00&10	4.60&10
.02	.04½	.04½	.04½	Tapioca Flour, high grade bgs.lb.	.04½	.05	.05	.04½
.01¾	.03¾	.03½	.03½	Medium grade, bags.....lb.	.03¾	.04	.04	.03¾
.....	.26	.26	.26	Tar Acid Oil, 15%, drums...gal.	.26	.27	.27	.26
.....	.29	.29	.29	25% drums............gal.	.29	.30	.30	.29
.....	.07	.07	.07	Coke Oven, tanks wks.....lb	.07	.08	.08	.07
6.50	16.00	13.50	14.87½	Kiln Burnt, bbl..........bbl.	.....	13.50	13.50	13.50
6.76	18.50	13.50	15.38½	Retort, bbls.............bbl.	13.50	15.00	15.00	13.50
.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bags or bbls mills.........100 lb.	1.15	1.75	1.75	1.15
.60	1.50	1.50	1.50	No. 2 bags or bbls...100 lb.	1.50	2.00	2.00	1.50
.80	2.00	2.00	2.00	Imported bags........100 lb.	.02	.02½	.02½	.02
.....	.20	.20	.20	Tetralene, 50 gal drs wks.....lb.	.....	.20	.20	.20
.....	.22	.22	.22	Thiocarbanilid, 170 lb bbl.....lb.	.22	.24	.24	.22
.11½	.20½	.17½	.19	Tin Bichloride, 50% soln, 100 lb bbls wks..............lb.	.....	.14½	.17½	.14½
.23	.48	.41½	.45	Crystals, 500 lb bbls wks...lb.	.....	.36½	.41½	.36½
.....	.71½	.58	.65	Metal Straits NY.........lb.	.....	.48	.58	.48
.36	.75	.70	.71	Oxide, 300 lb bbls wks.....lb.	.....	.53	.75	.53
.....	.48	.35½	.39	Tetrachloride, 100 lb drs wks ....lb.	.....	.30½	.35½	.30½
.....	.40	.40	.40	Titanium Oxide, 200 lb bbl...lb.	.....	.40	.40	.40
.....	.13½	.13½	.13½	Pigment, bbls wks.......lb.	.13½	.14	.14	.13½
1918	.40	.40	.40	Toluene, 110 gal drs wks.....lb.	.....	.45	.45	.40
.....	.35	.35	.35	8000 gal tank cars wks.....lb.	.....	.40	.45	.35
1918	.90	.90	.90	Toluidine, 350 lb bbls........lb.	.90	.94	.94	.90
1918	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.....	.85	.85	.85	Toner Lithol, red, bbls.......lb.	.85	.90	.90	.85
.....	.75	.75	.75	Para, red, bbls............lb.	.70	.75	.80	.70
1918	1.75	1.75	1.75	Toluidine.................lb.	1.70	1.75	1.80	1.70
.....	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.36	.50	.50	.36
.....	.70	.69	.69	Triphenylguanidine..........lb.	.69	.73	.73	.69
.....	.70	.70	.70	Phosphate, drums.........lb.	.70	.75	.75	.70
.....	2.50	2.50	2.50	Tripoli, 500 lb bbls......100 lb.	2.50	3.00	3.00	2.50
.49	.86	.53½	.65	Turpentine Spirits, bbls.....gal.	.61	.66	.66	.50½
.34	.76	.46	.55	Wood Steam dist. bbls....gal.	.....	.59	.59	.46
.....	.18	.18	.18	Urea, pure, 112 lb cases......lb.	.18	.20	.20	.18
.....	70.00	66.00	61.52	Valonia Beard, 42%, tannin bags.................ton	.....	58.00	76.00	58.00
.....	49.50	39.00	43.96	Cups, 30-31% tannin......ton	.....	Nom.	55.00	53.00
.....	68.00	43.00	48.52	Mixture, bark, bags.......ton	.....	48.00	64.00	48.00
.55	1.95	1.55	1.94½	Vermilion, English, kegs......lb.	2.00	2.10	2.10	1.75
.....	59.00	49.50	53.71	Wattle Bark, bags..........ton	.....	49.75	76.00	49.75
.....	.05¾	.05¾	.05¾	Extract 55%, double bags ex-dock..................lb.	.....	.06½	.06½	.05¾
.45	1.25	1.25	1.25	Whiting, 200 lb bags, c-1 wks ....100 lb.	.....	1.25	1.25	1.25
.....	13.00	13.00	13.00	Alba, bags c-1 NY........ton	.....	13.00	13.00	13.00
.55	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35
.....	.06½	.06½	06½	Zinc Ammonium Chloride powd., 400 lb bbls.............lb.	5.25	5.75	.05½	5.85
.08½	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.09½	.10	.10	.09½
.04½	.06	.06	.06	Chloride Fused, 600 lb drs. wks..................lb.	.....	.06	.06	.06
.04½	.06½	.06½	.06½	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½	.06½
.....	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.....	.40	.40	.40	Cyanide, 100 lb drums.....lb.	.40	.41	.41	.40
.05¾	.09	.09	.09	Dust, 500 lb bbls c-1 wks...lb.	.....	.09	.09	.09
.....	7.35	6.40	6.66	Metal, high grade slabs c-1 NY...............100 lb.	.....	6.45	6.40	6.07½
.05¾	.07¾	07¾	.07¾	Oxide, American bags wks..lb.	.07¾	.07¾	.07¾	.07¾
.06½	.10¾	.10¾	.10¾	French, 300 lb bbls wks..lb.	.10¾	.12¾	.12¾	.10¾
.02¾	.03½	03	.03½	Sulfate, 400 bbl wks.......lb.	.03½	.03¾	.03¾	.03½
.....	.30	.30	.30	Sulfide, 500 lb bbls........lb.	.30	.32	.32	.30
.....	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.....	.38	32	.37	Xylene, 10 deg tanks wks....lb.	.....	.33	.32	.32
.....	.36	.30	.35	Commercial, tanks wks....lb.	.30	.32	.32	.30
1918	.35	.35	.35	Xylidine, crude............lb.	.....	.38	.38	.38
.....	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs..lb.	.02½	.03	.03	.02½
.....	.45	.45	.45	Pure kegs................lb.	.45	.50	.50	.45
.....	.08½	.08	.08	Semi-refined kegs.........lb.	.08	.10	.10	.08

Oils and Fats

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.08	.14	.13	.13	Castor, No. 1, 400 lb bbls....lb.	.13	.13½	.14½	.13
.08	.14	.12½	.13½	No. 3, 400 lb bbls.........lb.	.12½	.13	.14	.12½
.....	.18	.17	.18	Blown, 400 lb bbls........lb.	.14	.15	.17	.14
.06½	.31	.13¾	.19	China Wood, bbls spot NY...lb.	.14½	.15	.17	.14½
.05¾	.18	.12½	.16½	Tanks, spot NY........lb.	.....	Nom.	.14¾	.14¾
				Coast tanks, Sept........lb.	.....	.13½	.14¾	.12¾
1918	.12	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10¾	.11½	.10¾
.09½	.09¾	.09	.09	Ceylon, 375 lb bbls NY....lb.	.....	.09¾	.10	.09½
.08½	.08¾	.08	.08¾	8000 gal tanks NY......lb.	.....	.08¾	.09	.08¾
.10½	.10½	.09½	.10	Cochin, 375 lb bbls NY....lb.	.....	.10	.10½	.09½

1480

GENERAL CHEMICAL COMPANY

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Disodium Phosphate
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Prices Current and Comment

Standard Purchasing Power of the Dollar: July 1914 $1.00 - Jan. 1927 68.7c - July 1927 71.7c - April 1928 67.8c

duction in Spain this year will be about 1,850,000 quintals, or less than a third of the 6,656,000 quintals produced last year.

This output would be the smallest yield in Spain in the last 20 years, except in 1910-1911 and 1912-13 when the yield was 1,085,000 and 630,000 respectively. A large carry-over of the 1927-1928 crop however, will prevent to some extent the high prices that might be expected, it is believed.

With regard to pickling classes, in particular, it is stated that the outlook is very poor, and groves that last year produced heavily have this year fallen to virtually a fourth of the heavy yield of 1927. The quality, however, of "queen" and "manzanilla" classes is said to be very good.

Palm Kernel Oil — Is in rather short supply at present, and as a result, has advanced during the past month to 9⅛c @ 9¼c lb.

Palm Oil — The arrival of shipments in considerable quantity during the past month, has resulted in a return to more normal price conditions. Lagos is now quoted at 8½c @ 8⅝c lb., and Niger at 8¼c @ 8⅜c lb.

Owing to greater soil fertility, a better and more intelligent labor supply, more freedom from Government restriction and especially to prolonged research and experiments in seed selection, Sumatra is rapidly becoming the world's main source of palm oil.

It is expected that by 1931 the export of palm oil from Sumatra will reach close to 40,000 tons and of palm kernels over 100,000 tons.

The quality of East Indian palm oil is said to be superior to that of West Africa, as it contains much less free fatty acid and commands, especially in the United States, a much higher price, as it is more suitable for edible purposes. Total acreage planted to oil palm in Sumatra now exceeds 100,000.

Perilla Oil — Is in somewhat better supply at the Coast so that tanks are now quoted at 14½c lb.

Red Oil — Demand has assumed greater proportions and as a result, this oil, which has been steady while stearic acid advanced by leaps and bounds, has staged an advance of its own and is now quoted at 9¼c lb. in tanks and 10⅛c @ 10⅝c lb. in barrels.

1914 July	1927 High	1927 Low	1927 Aver.		Current Market		1928 High	1928 Low
.05¼	.10	.08½	.09½	Tanks NY..............lb.	.09	.09½	.09½	.08¾
.....	.09½	.08½	.09½	Manila, bbls NY..........lb.	.....	.09½	.10	.08¾
.....	.08¾	.08½	.08⅝	Tanks NY..............lb.	.08½	.08¾	.08¾	.08
.....	.08½	.08	.08½	Tanks, Pacific Coast.....lb.	.07½	.08	.08½	.07¾
				Cod, Newfoundland, 50 gal bbls				
.36½	.66	.63	.64½	........................gal.	.63	.64	.69	.63
.36½	.59	.59	.59	Tanks NY..............lb	.....	.60	.63	.60
				Cod Liver see Chemicals.......				
1918	.06	.06	.06	Copra, bags.................lb.	.....	.05½	.06½	.05½
.06½	.11	.07	.10	Corn, crude, bbls NY........lb.	.....	.10½	.11	.10
.06½	.09½	.07	.08½	Tanks, mills.............lb.	.....	.08¾	.10	.08¾
1916	.14	.10½	.12	Refined, 375 lb bbls NY....lb.	.....	.11¾	.12½	.11¾
1916	.12	.11	.11	Tanks.................lb.	.....	.10¾	.11½	.10¾
.06	.09½	.06½	.08	Cottonseed, crude, mill......lb.	.....	.08½	.09½	.07¾
.07½	.11½	.08 1/5	.10	PSY, 100 lb bbls spot......lb.	.....	.1010	10.65	.09½
				Jan.—Mar...............lb.	.....	.1025	10.75	.09¾
				Degras, American, 50 gal bbls				
.02¾	.04½	.04½	.04½	NY.....................lb.	.04½	.05	.05	.04½
.03½	.04¾	do	do	English, brown, bbls NY...lb.	.....	.05¾	.05¾	.04½
.03½	.05½	.05½	.05½	Light, bbls NY..........lb.	.....	05½	.05½	.05½
.04¾	.07½	.06	.06⅝	Greases, Brown.............lb.	.....	.08	.08	.07
.05¾	.08	.06½	.07½	Yellow...................lb.	.08½	.08¾	.08¾	07
.06¾	.10¾	.08½	.09⅝	White, choice bbls NY,....lb.	.....	.11	.11	.09½
.....	.....	.....	.....	Herring, Coast, Tanks......gal.	.....	Nom.	.42½	.40
.009	.09½	.09	.09⅛	Horse, bbls.................lb.	.09½	Nom.	Nom.	.09½
.13	.16¾	.14¾	.15½	Lard Oil, edible, prime.......lb.	.....	.16½	.16½	.15½
.....	.13¾	.10¾	.12	Extra, bbls.............lb.	.....	.13½	.13½	.12
.09	.12½	.10⅛	.11½	Extra No. 1, bbls.......lb.	.....	.13	.13	.11
.078	.11 4/5	.10 2/5	.11	Linseed, Raw, five bbl lots....lb.	.....	.106	10.8	10.0
.077	.11 9-10	.09 6-10	.10⅛	Bbls c-1 spot...........lb.	.. ..	.102	10.4	9.6
.076	.10½	.09	.09 7-12	Tanks.................lb.	.....	.094	9.6	8.8
.....	.09¾	.09¾	.09¾	Lumbang, Coast.............lb.	.....	.09¾	.09¾	.09¾
.33½	.47½	.44	.46⅝	Menhaden Tanks, Baltimore.gal.	.....	.48	.48	.40
.....	.90	.10	.36⅝	Blown, bbls NY...........lb.	.....	.09	.09	.09
.43	.70	.67	.68½	Extra, bleached, bbls NY. gal.	.....	.70	.70	.67
.39	.66	.63	.62	Light, pressed, bbls NY....gal.	.63	.64	.64	.63
.37	.66	.69	.67½	Yellow, pressed, bbls NY gal.	.66	.67	.67	.66
				Mineral Oil, white, 50 gal bbls				
				........................gal.	.40	.60	.60	.40
				Russian, gal.............gal.	.95	1.00	1.00	.95
.14	.18¾	.14½	.17½	Neatsfoot, CT, 20° bbls NY..lb.	.....	.19	.19	.18½
.....	.13½	.10½	.12	Extra, bbls NY...........lb.	.....	.13½	.13½	.12
.....	.16¾	.12½	.14½	Pure, bbls NY............lb.	.....	.15½	.16½	.15½
.08	.18½	.10	.13¾	Oleo, No. 1, bbls NY ....lb.	.....	.11¾	.17¾	.11¾
.07½	.17	.08¾	.12	No. 2, bbls NY...........lb.	.....	.11	.15½	.11
.07½	.14	.08½	.10½	No. 3, bbls NY...........lb.	.....	.10½	.14	.10½
.83	1.75	1.40	1.48½	Olive, denatured, bbls NY...gal.	1.25	1.32	1.40	1.18
1918	2.00	2.45	2.15	Edible, bbls NY.........gal.	1.95	2.00	2.00	1.75
.07½	.10½	.08¾	.09⅛	Foots, bbls NY...........lb.	.10½	.10¾	.10¾	.09¾
.08¾	.09½	.09	.09½	Palm, Kernel, Casks.........lb.	.09⅛	.09¼	.09½	.08½
.07	.08¾	.07½	.08	Lagos, 1500 lb casks.......lb.	.08½	.08⅝	.09½	.07¾
.....	.08¾	.07½	.07½	Niger, Casks..............lb.	.08¼	.08⅜	.08⅜	.07
.....	.14½	.12	.12	Peanut, crude, bbls NY......lb.	.....	Nom.	.12½	.12
.....	.15½	.14½	.15	Refined, bbls NY.........lb.	.14½	.15	.17	.14½
.....	.16½	.12½	.14	Perilla, bbls NY............lb.	.20	.21	.21	.13
.....	.14½	.10	.12	Tanks, Coast...........lb.	.....	.14½	.15½	.10½
.....	1.70	1.70	1.70	Poppyseed, bbls NY........gal.	1.70	1.75	1.75	1.70
.63	1.05	1.00	1.01	Rapeseed, blown, bbls NY...gal.	1.03	1.04	1.06	1.01
.....	.90	.82	.87	English, drms.NY........gal.	.83	.84	.92	.83
.....	.85	.76	.80⅝	Japanese, drms.NY......gal.	.82	.83	.90	.81
.06¾	.10	.09	.09	Red, Distilled, bbls..........lb.	.10¼	.10⅝	.10⅝	.09½
.....	.09½	.08½	.08⅝	Tanks.................lb.	.....	.09¼	.09¼	.08
.....	.50	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.50	.42
.....	.47	.43	.45	Sardine, Pacific Coast tks....gal.	.....	.47	.47	.41
.08½	.13	.11½	.12½	Sesame, edible, yellow, dos....lb.	.12	.12½	.13½	.12
.....	.14	.14	.14	White, dos..............lb.	.12½	.13	.15	.12½
.34	.40	.40	.40	Sod, bbls NY..............gal.	.....	.40	.40	.40¾
.....	.09¾	.09½	.09¾	Soy Bean, crude...............				
.06½	.....	.....	.....	Pacific Coast, tanks.......lb.	.....	.09¾	.09¾	.09
.....	.12½	.10¾	.12	Soy Bean, crude, bbls NY....lb.	.12½	.12½	.12½	.12
.....	.11	.10½	.10½	Tanks NY.............lb.	.....	.10¾	.10¾	.10½
.....	.13	.12	.13	Refined, bbls NY.........lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.70	.85	.84	.84½	NY....................gal.	.84	.85	.85	.84
.68	.82	.79	.80½	45° CT, bleached, bbls NY.gal.	.79	.80	.80	.79
				Stearic Acid, double pressed dist				
1916	.13½	.11½	.12	bags...................lb.	.18	.18½	.18½	.11
				Double pressed saponified bags				
1916	.14	.11½	.12	........................lb.	.18½	.19	.19	.11½
1916	.15½	.13½	.14	Triple, pressed dist bags...lb.	.20	.20½	.20½	.13½
.07¾	.13	.08¾	.11	Stearine, Oleo, bbls..........lb.	.11	.11½	.12½	.09½
.06	.09	.07½	.08	Tallow, City, extra loose.....lb.	.09½	.09½	.09½	.08½
.07	.11	.08½	.10	Edible, tierces ....lb.	.10½	.10¾	.10¾	.09¾
.09	.10¾	.08½	.10	Tallow Oil, Bbls, c-1 NY...lb.	.....	.12½	.12½	.11½
.09½	.12½	.10	.11	Acidless, tanks NY........lb.	.....	.11½	.11½	.10½
.....	.08½	.07½	.07¾	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
.04¾	.11	.11	.11	Turkey Red, single bbls......lb.	.11	.12	.11	
.05¾	.14	.14	.14	Double, bbls.............lb.	.14	.16	.16	.14
				Whale, bleached winter, bbls				
.50	.78	.78	.78	NY....................gal.	.78	.80	.80	.78
.52	.80	.80	.80	Extra, bleached, bbls NY..gal.	.80	.82	.82	.80
48	.76	.76	.76	Nat, winter, bbls NY.....gal.	.76	.78	.78	.76

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Department of Labor Views on Chemical Hazards

By Dr. C. T. Graham-Rogers
New York State Department of Labor

To properly express the view point of the Department of Labor with reference to the health hazards in the chemical industry it is necessary to preface such a discussion with a brief outline of the organization of the department and the functions of a few of its component parts.

The Industrial Commissioner is the executive head of the department and is charged with the administration of the Labor Laws and the Workmen's Compensation Law.

The Industrial Board is in character the judicial and legislative body of the department inasmuch as its duties are to make, amend, or repeal rules for carrying into effect the provisions of the Labor Law, and having broad powers with reference to the carrying out of the sections of the Compensation Law.

Defining an accident in its generally accepted sense as a surgical injury, Dr. Graham-Rogers is of the opinion that an accident should more be properly be segregated into Traumatic Accidents and Health Accidents to be appropriate and definite. This article affords an insight into the workings of the Department of Labor.

The Inspection Bureau constitutes in effect the police agency of the department for its main function is to see that the Labor Law and Industrial Code Rules are complied with, and likewise to secure a compliance by prosecution measures if so required.

The Compensation Bureau is concerned solely with the administration of the Workmen's Compensation Law. The personnel determine the validity of a claim, the extent of disability and the amount to be awarded the claimant.

The Bureau of Statistics and information complies and publishes the statistical information gathered by the personnel of the other Bureaus as well as special statistical data gathered by its own personnel, and all to reference to accidents.

The Division of Industrial Codes formulates the Industrial Code Rules necessary to clarify the Basic Laws and so specifically apply the provisions to industrial conditions in that there is afforded measures to prevent accidents.

The Bureau of Industrial Hygiene constitutes the research bureau of the department. Its functions are diversified. The personnel must undertake scientific investigations of industrial processes as well as physical examinations of workers in order to determine the health hazard present in an industry so that the other bureaus concerned with the administration of the Labor Laws may be informed of data necessary in formulating or repealing laws or rules applicable to processes of manufacture and concerned with hazards.

When required, the bureau furnishes the expert testimony necessary to sustain a prosecution for failure to comply with the Labor Law.

Among its province is that of affording the referees of the Compensation Bureau advice as to the processes of manufacture and the accompanying health hazards in industry, so that quick disposition may be made of claims appearing for hearing on the occupational disease calendars.

The bureau compiles and publishes a monthly bulletin of Industrial Hygiene, manuals, and special bulletins dealing with health hazards arranged especially for the physician, industrial heads, and the worker.

Visual education by means of moving pictures and exhibits are carried out as safety measures: illustrated lectures are also given to the workers in the industry. The safety inspectors and medical inspectors are constantly engaged in activities to advise and assist plant executives in installing safety measures for the prevention of accidents. The industries as well as the workers are acquainted with the objects of the bureau and invited to make full use of the facilities, limited as they are, so that all may be impartially served.

This then is but a brief of a few bureaus of the department (and there are over twelve) with reference to accidents.

It is patent that the view of each individual bureau head cannot be expressed in this discussion. My position is of one giving an opinion as derived from observation and coordination with other bureaus; but an expression an be definitely expressed with reference to the view point of the Bureau of Industrial Hygiene.

For a proper discussion it becomes requisite that we first consider the chemical industry as classified by the Department of Labor for use as an aid in applying the laws and in securing statistical data. Such arrangement is as follows:

1. Drugs and chemicals: (a) proprietary medicines; patented medicines and pills, plasters medicated, salves. (b) chemicals; acids, alcohol, alkalies, alum, ammonia, baking powder, bleaching materials, calcium carbide, caustic soda, coal tar products, compressed gases, cyanides, disinfectants, gas mantles, insect powder, liquefied gas, metal polish, pharmaceuticals, potash, saltpetre, soda, sulfur, washing fluids.

2. Paints, dyes and colors; 3. Wood alcohol and essential oils; 4. Animal and mineral oil products; 5. Soap, perfumery and cosmetics; 6. Miscellaneous chemical products, starch, glue, mucilage, etc., flypaper, paste, sizing, fertilizers, matches and explosives, ammunition, fireworks, gunpowder, photographic supplies and photography.

Industry must carry on and production cannot cease. Health accidents will occur. Protective or preventive measures must be instituted not only to conserve the worker's health, but the industry itself.

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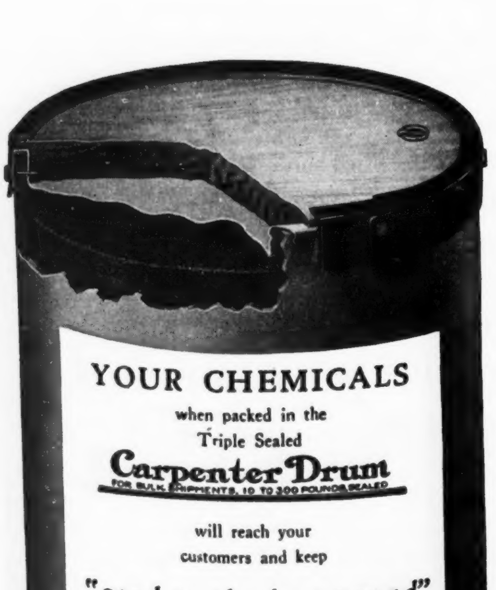

A multiplicity of blanket laws is more likely to impede than to aid progress in preventive work. More laws are not only difficult of enforcement, but are less likely to create harmony in industry.

Industry as a rule if properly aided does much to solve its own problems as to health hazards, and this is equally true of the chemical industry.

Notwithstanding the fact that one of the functions of the department is to secure enforcement of the Labor Laws by drastic measures if necessary, yet it must be borne in mind that another function is to ascertain if any measure works a hardship on the industry, and still another function is that of relieving industry of any undue burden, if proper cause for so doing can be established.

The department considers that laws and rules applicable to industry were enacted after due consideration, and expects industry to comply with the provisions of such laws and rules.

The Bureau of Industrial Hygiene looks upon the Chemical Industry as a hazardous one, but it also realizes that to make general statements, not based upon facts, as to the dangerous nature of such an industry is not sound economics.

Statistical data to hand does not actually show the health hazard present, but is hoped for that better information may aid in formulating industrial code rules especially applicable to the chemical industry, which will minimize or eliminate health accidents and still not impose upon the industry an incumbrance.

The industry as a whole is not the most hazardous, for many other industries have as a component some industrial process that could be considered as a branch of the chemical industry, and relying upon data, it would appear to be more hazardous than the chemical industry.

The needed labor for the chemical industry is not as available as it was ten years ago, therefor if labor is to be secured, the industry must not be unduly exploited as a most dangerous work which should be practically prohibited, and certainly the department does not view it in such a light.

Health hazards are known to exist and health accidents do occur in the chemical industry, it is a matter of official records. These accidents cannot be entirely prevented but they can be minimimized and this is a matter of official investigation.

To reduce health accidents in the industry requires co-ordinate action on the part of the state, the industry and the worker. The state and industry must labor to discover harmless substance to replace those that constitute the hazard, and in addition originate preventive devices and measures as applied to the process of product.

Industry must also continue along channels to perfect machinery or apparatus that will eliminate from the process the greater part of the hazard.

The worker must likewise assist.

First: by looking to his own physical well being, this in consulting competent medical practitioners and abiding by the advice given.

Second: by observing the rules of personal and industrial hygiene as applied to himself.

Third: Obeying the instructions issued by the industry he is employed in, and making use of all safe-guards as provided for the workers or connected with processes of manufacture or the resulting product.

Until such concerted action occurs the industry will continue to be the target of biased or unscrupulous investigators.

It must be conceded that adequate compensation for health accidents is neither philanthropy nor charity, but an economic duty industry owes the worker exposed to a hazard. It has a value in that the search for protective measures is stimulated, and often there is discovered new hazards for old ones.

A nation is strong only in proportion to its weakest manpower. There is no reason why workers in the chemical industry should not have a long span of life, and be physically fit. It can be accomplished, it spells sound economic conditions in the chemical industry and becomes an aid in developing a more virile nation.,

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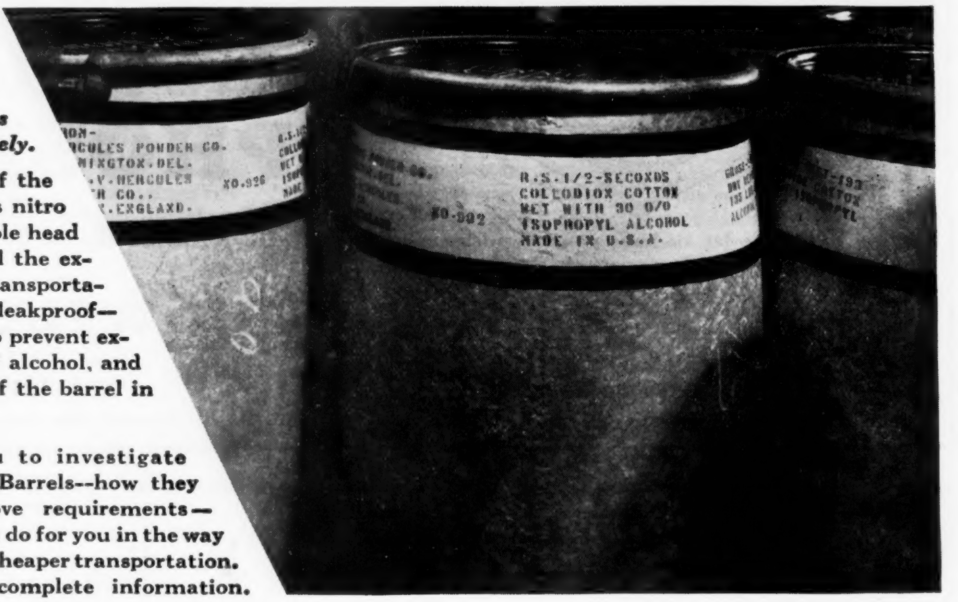

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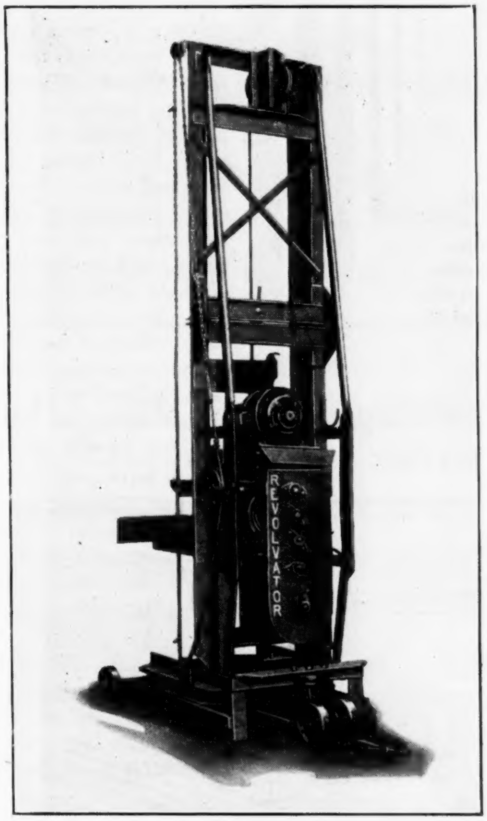
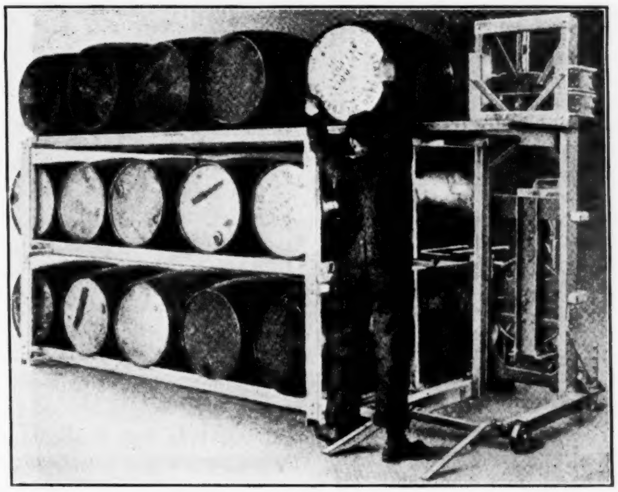
A TRIP through the plant of one of the leading portable elevator manufacturers causes one to wonder that these seemingly indispensable machines are not standard equipment in every well managed and efficient plants. Its advantages to an industry with a container handling problem are manifold.

As is generally known the use of these machines is designed to be that of lifting anything from a bag of soda ash to a grand piano to a distance above the floor level which is not possible to accomplish by hand. Every plant has its individual difficulties to overcome and it is for this reason that it is not feasible to turn out these machines as a standard unit.

To endeavor to outline in detail the mechanism of a portable elevator would be difficult in the extreme. While it is true that the basic mechanism of these machines is quite simple in most instances the elevators are built and modeled after the customer's individual specifications.

The present day type of elevator comes under two subdivisions of hand operated and electrically operated. The machine in most common use—depicted here—is the telescopic model. This model is built to a height of about nine feet with a lifting surface or platform measuring about two by three feet. This platform is of wood, steel or roller construction, according to individual need, and it is here that the first radical departure in design is noted. These platforms may be of stationery or revolving types with the latter model a decided favorite of recent years. The barrel, drum or case is run on to the platform by hand or truck and in the case of the hand operated machine, an operation similar to cranking an automobile is all that is required to raise the platform to the desired level of the rack. The operation is quite simple and can be trusted to unskilled labor after but short instruction. The electric motor model accomplishes the same end by an electric button system which is even more simple than that operated by hand. When the load has reached the desired level for storing on the racks the advantage of the revolving platform is obvious in that the platform may make a complete turn by application of a foot lever, thus affording quite a range.





The close-up view in the upper illustration shows the compactness and simplicity of the modern portable elevator. Note the runners which afford a wide range of operation. Below is shown the platform at a level which enables the expedient transfer of the barrel to the rack.

With the perfection of the telescopic type elevator the manufacturers claim that the demand for a machine to reach any given height has never reached the maximum height of which the machine is capable. As the name implies, the telescopic model has several sectional parts which are elevated in much the same manner and by the same general principal as an extension ladder. When the platform reaches the top of the first section it becomes stationary and the movement is then transferred to the first section which in turn is elevated to the length of its own height and so on to practically any height desired.

As a machine of the type shown is capable of bearing a load of several thousand pounds it is sometimes necessary to furnish additional weight to the base of the machine to eliminate the possibility of the loaded platform outweighing the machine base. Otherwise there is no difficulty encountered in raising loads to unusual levels

Prior to the advent of the telescopic type elevator some few years ago, the old stationary type elevator sometimes confined the movement of the machine to one room. The principal difficulty encountered was in moving the portable elevator from one storage room to another with a low door restricting the movement unless the entire superstructure of the elevator was removed and reattached after the completion of the passage under the low overhead leverage. Provision was usually made for this contingency in construction in that the top

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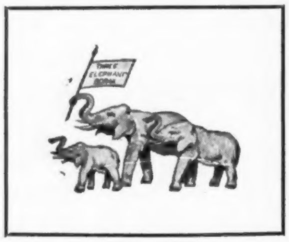

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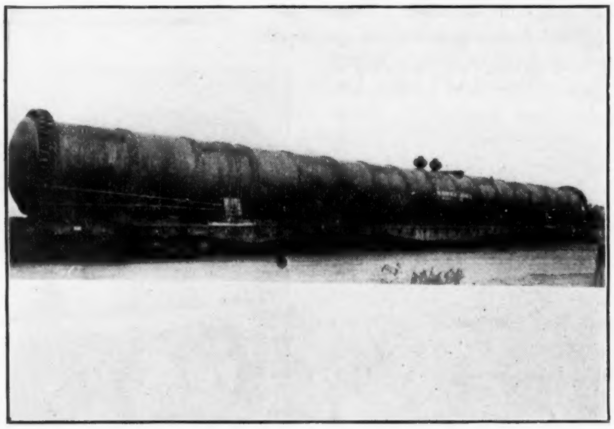
section was removable, but the operation was unweildy at best, and ofttimes dangerous to the laborer.

As stated above, the operation of the portable elevator is simple in the extreme and unskilled labor can be taught its use in a very short while. Its principal parts are ruggedly constructed and there are many machines in operation today whose manufacture date back to the early days of the twentieth century. Simplicity of operation reduces the hazard of personal injury to a minimum. There are two ways in which injury may be sustained by an operator. The first of these is by overloading the platform to the extent that too great a strain is placed on the main hoisting cable which if snapped will precipitate the load to the floor level with disasterous results to the operator if in the path of the descending platform. The second means of injury may be caused by carelessness in exposing the limbs or clothing to the cog wheels while the machine is in operation. In the comparatively few instances of injury, the latter has been the more common. However, the possibility of either form of injury are forestalled by the present day manufacturer. Safety devices are now standard equipment on most elevators. In the event of a blown fuse or a snapped cable the elevators are equipped with an electrically operated brake which checks the fall of the platform at a given point. The possibility of injury by contact with the cog wheels has been eliminated by the installation of housings for all moving parts. Thus, any user of the portable elevator may be fully protected by specifying these safety devices when ordering the machine. Because of several state rulings to the effect that these devices must be standard equipment on machines used in those states, the manufacturers have, in most cases, foreseen that the day is fast approaching when these devices will be required in all states and have made provision for this by installing safety devices on all machines.

It is estimated that one laborer can easily handle the ordinary job of lifting and racking containers and moving the elevator as required. From this angle, and by comparison with the hand method of storing—often requiring two and three men per package— the portable elevator offers a distinct labor and time-saving advantage.

Combustion Engineering Corp., reports that its affiliated company, the Hedges-Walsh-Weidner Company, Chattanooga, Tenn., has recently shipped to the Gulf States Creosoting Company, an unusually large steel drum to be used for pressure creosoting. The shell is 140 ft. long, 8ft. in diameter and has a plate thickness



of one inch. This is believed to be the largest steel drum ever shipped as a completely assembled unit. It weighs between 150 and 200 tons and is shown in the accompanying photograph loaded on five flat cars ready for shipment.

Another interesting shipment recently made from this plant was a car tank for nitric acid,—the first nitric acid car tank to be built in this country. This tank is 6ft. 1½ in. inside diameter and 31 ft. 9 in. long. The top two-thirds of the shell is made of 5-16 in. steel, the bottom is made of 7-16 in. steel and the heads are made of 9-16 in. steel.

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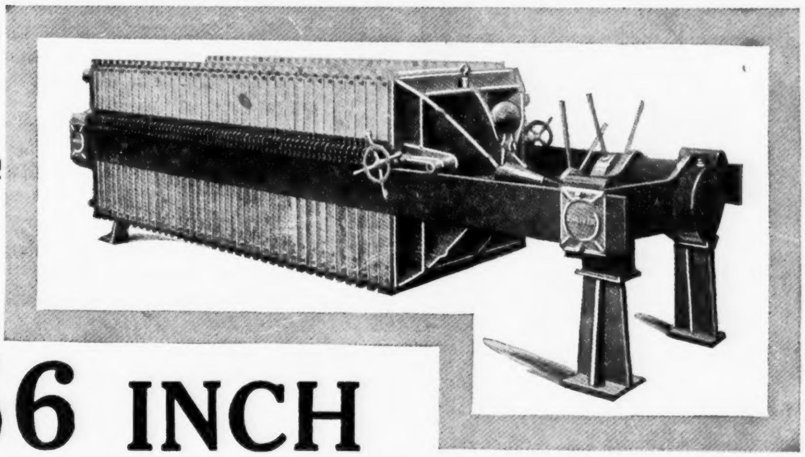

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I. G. Farbenindustrie Acquires Interest in British Rayon Firm

I. G. Farbenindustrie announces that it has acquired minority shares of British Breda Silk (Ltd.), London. This association is significant in tying up the German I. G. directly with a foreign producer of rayon, in which the I. G. itself has become more or less considerably specialized in recent years. It associates the I. G. with an enterprise that is independent of the international rayon trust composed of Courtaulds-Vereinigte Glanzstoff-Snia Viscose, although the I. G. operates partly in conjunction with the latter, according to Trade Commissioner William T. Daugherty, Berlin.

The German I. G. produces artificial silk by the three commercial processes, namely, viscose, cupro-ammonia, and acetate. Its viscose plant is operated at Wolfen-Bitterfeld, the Agfa and Koeln-Rottweil companies participating, and its copper-ammonia production at Dormagen Cologne. An acetate rayon plant at Berlin Lichterfelde is shared half and half by the I. G. (Agfa) and Vereinigte Glanzstoffabriken Akitengesellschaft, Elberfeld. The I. G. controls two-thirds of Hoelkenseide Gesellschaft mit beschraenkter Haftung, at Barmen, while the other third is owned by the I. P. Bemberg Co.

At the end of May, 1928, the I. G. announced that its daily production was up to 11,000 and 12,000 kilos of viscose and cupra-ammonia rayon, and that with contemplated extensions, it was to reach 22,000 kilos daily.

British Breda Silk Co. is a subsidiary of the Netherland rayon industry in Breda. It was registered in July with a nominal capital foundation of £1,000,000, of which £650,000 were to be issued, £250,000 being taken by the International Viscose Co., holding company of Breda, and £100,000 to the Belgian Consortium Industrielle de la Soie in Brissels, owning Breda patents.

Netherland Breda is interested in Soie de Valenciennes, thus making the new combination inclusive of some French interests.

British Breda is reported as proposing to erect a viscose plant in Duffield (Derby) with an annual capacity of 3,000,000 pounds of rayon; this is as large as the plant in Breda.

The only Polish factory manufacturing calcium cyanamide, located in Chorzow, Upper Silesia, and conducted as an independent government-owned enterprise, produced 114,168 metric tons of calcium cyanamide during the first three-quarters of the current year which, computed in terms of pure nitrogen, amounts to 25,127 metric tons, according to Commercial Attache Clayton Lane, Warsaw. Of the total production, 10,256 tons of calcium cyanamide (in terms of pure nitrogen, 2,261 tons) were used by this factory for the manufacture of ammonium hydroxide. It is proposed to increase production by 30 per cent. During 1927 net profits of this factory amounted to 15,000,000 zlotys.

A Peruvian industrial and commercial stock company has been organized to operate under the name of "Imperial Industries," with headquarters at Lima. The new company will handle the products of the Imperial Chemical Industies, (Ltd.) of England, including industrial chemicals, military explosives, ammunition, nonferrous metals, artificial leather, fertilizers, dyestuffs, etc., reports Commercial Attache O. C. Townsend, Lima.

A cartel of six Polish dyestuffs factories bas recently formed in Poland. It is said that this union was effected to compete with German producers and an attempt will be made, it is thought, to eliminate German products from the Polish markets, reports Consul R. W. Heingartner, Frankfort on the Main.

American Electrochemical Society will hold its 1929 Spring meeting at Toronto, May 27 to 29. Dr. W. L. Miller, University of Toronto is chairman of the local committee.

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Dye Makers Compete for Markets

Competition in dye-making in the United States has been so keen in the home market that many weaker producers have been eliminated, according to a statement made public by the Tariff Commission.

As a result of the war-time stimulus to dye making, the dye-producing countries of the world are equipped to produce a far greater quantity of dyes than they are able to consume. This excess capacity to produce has precipitated a struggle for foreign markets and has led each producing nation to adopt special measures for the protection of its home market.

The struggle for export markets is most severe in the non-producing nations, China and British India. The United States, Great Britain, and France have established a trade in the bulk dyes in these countries and are combating the efforts of Germany and Switzerland to regain their former control of the entire trade.

Germany and Switzerland continue to dominate the international dye trade. In Germany centralization and co-ordination of dye manufacture by the I. G. has resulted in low manufacturing cost. Long agencies, and branch plants throughout experience, the establishment of sales the world, and the negotiation of international agreements are also factors of German supremacy.

Recent activities of the I. G. in extending its manufacturing interests to include a wide diversity of chemicals and allied products other than dyes are also enhancing the prestige of Germany. In high-priced dyes Germany still dominates the world markets, but in bulk dyes she has lost a part of her trade to the new producing nations.

The I. G., by steadily increasing its influence, is seeking to recover this lost trade.

The table shows the exports of dyes from Germany in 1913, and the trend of the export trade since 1920.

	Pounds	*Value*
1913	239,598,133	$51,666,168
1920	61,140,171	53,002,407
*1921	48,304,991	15,935,585
1922	115,974,900	80,781,892
1923	73,974,473	41,580,742
1924	61,033,911	30,933,368
1925	75,879,025	44,311,155
1926	81,883,253	47,134,156
1927	107,593,519	55,413,142

*May to December.

As previously pointed out, exports from Germany in 1927 showed an increase of about 17.6 per cent. in value and 31.4 per cent in quantity over 1926. As compared with pre-war years, the volume of Germany's export trade has greatly declined. In value, however, the 1927 export showed an increase of 7.2 per cent. over the 1923 figure.

Export figures, taken alone, do not disclose the actual participation of Germany in the international trade, for the reason that the I. G. controls or has an interest in dye plants in Japan, Spain, the United States, and Russia, and handles through its extensive subagencies products not of their own manufacture.

Switzerland has now, as prior to the war, a larger share of the world's trade than the relative size of her industry indicates. The Swiss specialize in high priced dyes, in the manufacture and marketing of which they have advanatges which come from long experience, a well-organized selling force throughout the world, and the diversity of their products.

They operate, or have an interest in, plants in the United States, France, Great Britain, Germany and Italy. The disadvantages of a lack of raw materials is not serious, as crudes and intermediates are available from several nations.

In the United States competition has been so keen in the home market that many of the weaker producers have been eliminated.

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Improved Method for Producing Sulfuric Acid Claimed in France

A substantial improvement of the chamber process of making sulfuric acid is claimed for the so-called "Chambres Rene Dior." A sulfuric acid plant constructed on the Dior principle has been successfully operated during the past few years at Landerneau, near Brest, France. The outstanding advantages claimed for the Dior chambers over the chambers heretofore used in France are those of (1) increased productive capacity per cubic unit of chamber space (it is said that the Dior chamber will produce as high as 40 kilos at 53° Baume per cubic meter) and (2) considerable saving in the original cost of installation as well as in maintenance, the latter advantage being due primarily to the relatively small amount of lead involved in the construction of the Dior chambers.

The Dior chambers require less substantial and therefore less costly foundations involving less wood as well as less lead in their construction. The building of the Dior chambers is said to represent a saving of approximately 70 per cent. in cost of installation. From standpoint of maintenance cost, the economy is likewise claimed to be considerable as a single lead-worker is required for the upkeep of the Dior chambers. In addition to this, the disposition of the lead used in the Dior chamber, together with the actual process involved, permits the lead to remain intact over a considerable period. It is further claimed that the consumption of nitric acid in the Dior process is reduced to about one half that of the other processes. A typical Dior plant, with a daily capacity of 30 tons of sulfuric acid at 53° Baume comprises four chambers of 200 cubic meters each.

The Bureau of Foreign and Domestic Commerce has not investigated this new process and can therefore assume no responsibility as to its commercial value. Further details furnished by Trade Commissioner Louis Hall of Paris will be furnished eligible firms upon request to the Chemical Division.

Overproduction of lithopone in Germany has caused the suspension of operations in a number of small plants. The result of this situation has brought about acquisition of the small firms by a few large firms for the purpose of controlling production. The two companies which already control the greater part of the German lithopone output and are leaders in the consolidation movement are the A. G. fur Bergbau and Chemische Industrie Sachtleben (known as Sachtleben) and Sachtleben, its factory closed and the output quota transferred to Homberg. Similarly, the I. G. Farbenindustrie has assumed the output of the Lithopone fabrik of Furfurt and der Lahn, belonging to H. & E. Albert of Blibrich. In the latter case, an annual indemnity is paid to the owners of the closed factory. Further, the A. G. fur Chemische Industrie Gelsenkirchen had just completed a new plant when Sachtleben and the I. G. together obtained the majority of its stock. Other companies now controlled by Sachtleben and the I. G. are the Lithopone-fabriken Chemische Fabrik Marienhutte of Langelsheim, A. G. for Lithoponefabrikation of Triebes, and Bourhau & Co. of Schoningen.

The domestic sales of German Lithopone, which were before the war about 9,000 tons, increased in 1927 to about 15,000 tons, reports Consul R. W. Heingartner, Frankfort on the Main.

Following the announcement of the manufacture of crystalline glucose from wood in Germany and Switzerland, comes another interesting development in the starting of a Bergius company in Heidelberg with the significant name of Wood Hydrolysis, Inc. (Holzhydrolyse, A. G.) Purpose of the company is to apply the process used for the manufacture of carbohydrate fodder from wood and sawdust and to develop kindred processes. Dr. Friedrich Bergius is chairman of the board, while other members are Dr. Fritz Bing of Mannheim and Sir James C. Calder of London.

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Fertilizer Changes in Japan

American synthetic fertilizers, including products of the American Cyanamid Co. such as Ammohos, Nitrohosca, Roinahos, Nitrochaulk and others, have found their way in large quantities into the Japanese market, which is causing deep concern over the Japanese ammonium sulfate market. American merchants in Japan are making strenuous efforts to find a wider market for these fertilizers in this country. The sales manager of the Dai Nippon Artificial Fertilizer Co. on his recent inspection trips in rural districts, including Yamagata, Niigata and Fukushima prefectures, all large consuming centers, has found that farmers in these districts have begun to consume a fair amount of these synthetic fertilizers, mostly imported from America, at the expense of ammonium sulfate. If these fertilizers are imported here in a large quantity in the future, he believes that Japanese fertilizer producers will be seriously hurt. Measures may be adopted by the Government to counteract the situation before it becomes too serious.

Although fertilizer companies outside Japan are bending their energy to the manufacture of these new fertilizers, to such an extent that some have virtually suspended production of sulfate of ammonia; this is a striking contrast with Japan where the ammonium sulfate industry is becoming one of the fastest growing enterprises. The extension of plant equipment in connection with ammonium sulfate manufacture is proceeding at top speed among Japanese fertilizer companies.

The Showa Fertilizer Co., and the South Manchuria Railway Co. have jointly purchased a German patent right for producing nitrogen fertilizer together with the equipment capable of producing 150,000 tons, for yen 18,000,000. The price is said to be exceptionally cheap. This is evidence of the fact that the sellers placed no great faith in the future development of the ammonium sulfate industry. The annual consumption of sulfate of ammonia in Japan reaches more than 400,000 tons, twice the amount for 1923. Even the Dai Nippon Artificial Fertilizer Co., which used to produce mostly superphosphatic fertilizer, has commenced manufacturing sulfate of ammonia and erected the Toyama plant exclusively for that purpose.

Soya bean cake from Manchuria, which was once the sole master of Japanese fertilizer market, has dropped sharply in demand. This is attributed to the cheaper price of ammonium sulfate. The Japan Electro-Chemical Fertilizer Co. has changed its business policy from the production of ammonium sulfate to that of lime nitrogen. The consumption of lime nitrogen in Japan last year totaled only 30,000 tons but that figure is expected to be doubled this year. This year's production of sulfate of ammonia will total 280,000 tons but it should increase rapidly from now on, due to the extension of plants, so that in 1932 the amount is expected to reach 970,000 tons, three and a half times present production. As soya bean cake has been outstripped by ammonium sulfate, so ammonium sulfate may be left out of competition with new synthetic fertilizers, is belief in Japan.

The Sumitomo Fertilizer Manufacturing Co., Osaka, has decided to embark upon an ammonium sulfate industry after other large fertilizer companies in this country. According to an announced program, the company has purchased an ammonium sulfate manufacturing machine from the American Nitrogen Engineering Co. and the seacoast along Niihama in Shikoku island, covering an area of 100,000 tsubo, will be reclaimed for erecting factories. The company plans to manufacture 30,000 tons at first and will expand factory equipment as needed to a capacity of 100,000 tons. The initial product is expected to be placed on the market in April, 1930.

The Dai Nippon Artificial Fertilizer Co. has effected a merger with the Hokuriku Artificial Fertilizer Co. with headquarters at Toyama, where the former's new ammonium sulfate factory stands. The capitalization of the former company will be increased to yen 37,000,000. By the merger, the Dai Nippon interests mean to prevent the Hokuriku district from being encroached upon by other fertilizer interests such as the Sumitomo and the Taki companies.

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Considering potassium chlorate an important item for national defense, the Polish Government is offering producers an export premium in the form of a customs drawback in order to encourage continued production. Polish production amounts to about 1,200 tons annually, but only 650 tons are consumed locally. This leaves exportable surplus of 550 tons which has been so handicapped by German competition that Polish factors were planning to curtail production. It is hoped that the new export premium will prevent decreased production.

Polish production of potassium salts during the first three-quarters of the current year averaged nearly 80,600 metric tons per quarter as compared with the average quarterly production last year of 68,800 metric tons. Production from January 1, 1928, to September 30, 1928, amounted to 119,080 metric tons of kainit and 122,570 metric tons of other crude potassium salts, a total of 241,650 metric tons. Of this amount, 15,669 metric tons were exported and the balance sold to domestic consumers.

Glycerine from molasses by fermentation with low production costs is reported from Czechoslovakia. Although process is regarded as secret it is said to be similar to so-called "protol" method used by Germany during war. This new competition is worrying local soap manufacturers, according to the Department of Commerce, coming as it does on top of increasing importance of glycol, which has already cut into their export markets for glycerin.

Packing of rolled sulfur in double burlap bags by American exporters is held to be the chief reason for the tremendous increase of American sulfur imported into Bahia, Brazil. During the first half of this year 41,763 kilos were imported, of which 30,763 kilos came from the United States and 11,000 kilos from Great Britain. This compares with 35,650 kilos from the United States to 55,292 kilos from Great Britain during the entire year of 1927.

Labor conflicts in the pulp industry causes Swedish imports of sulfur and pyrites to decline. Many plants employing sulfuric acid processes were forced to shut down during first four months of this year. Imports of sulfur from the United States declined from 22,850 tons in the first thalf of 1927 to 10,290 tons in the first half of 1928. Imports of pyrites from Spain fell to 48,551 tons from 54,475 tons in first half of previous year.

Anshan Iron & Steel Works, South Manchuria, is marketing benzol for use as a motor fuel. Production during fiscal year ended March 31, 1928, reached 434,750 gallons. It is sold on the market for 6 yen per case of ten gallons while motor spirit costs approximately 7.5 yen per case (1 yen—\$0.4578 U. S. currency). However, while the price of gasoline has been decreasing recently, the price of benzol has remained unchanged.

Two of the three Japanese producers of sodium peroxide purchase their caustic soda from Brunner, Mond & Co. The source of supply for the third is unknown. The first two are Hodogaya Soda K. K. and Toya Soda K. K. with combined daily production of 6,000 pounds. The third is Nihon Soda Co. with production of 5,000 pounds daily. Production of three supplies demand for sodium peroxide for daily consumption.

A higher rate of duty will be imposed upon ammonium sulfate imported into Spain in order to raise funds to establish a Government-subsidized atmospheric nitrogen industry in that country.

A new superphosphate plant with capital of £250,000 will be established at Ravenbourne, Dunedin, New Zealand.

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German Production of Potash Registers Increase Over 1926

The German potash industry produced in 1927 approximately 11,070,000 metric tons of crude potash salts with a pure potash content of 1,519,000 tons, according to figures just released by federal authorities. Comparative 1926 figures were 17.7 per cent. less for crude salts and 20.5 per cent. less for pure potash. The 1927 production was, however, 8 per cent. less than 1925 and 15.3 per cent. less than 1922, the record year, according to Trade Commissioner William T. Daugherty, Berlin.

The production during 1927 was supplied by an average of 60 out of 228 German shafts, against 66 in 1926. Effective January 1, 1927, the process of closing down further German mines was terminated under the so-called Closing-Down Decree, of October 22, 1921.

Comparative production figures (not to be confused with Potash Syndicate sales figures) are as follows:

Year	*Crude Salts Metric tons*	*K_2O Content Metric tons*
1913	11,607,500	1,325,700
1924	8,072,400	1,014,100
1925	12,044,200	1,572,500
1926	9,406,100	1,260,000
1927	11,069,600	1,518,700

Sales by the Potash Syndicate in 1927 amounted to 4,277,000 tons, effective weight of salts (reduced from the crude) with 1,239,000 tons K_2O content.

German agriculture took 62.9 per cent. of the 1927 production and export sales accounted for the remainder. The leading foreign customers in the order of their purchases were: United States, The Netherlands, Great Britain, Poland, Czechoslovakia, and Sweden.

Sales of individual grades of fertilizer salts were divided as follows:

	1913	*1926*	*1927*
	(*Metric tons K_2O*)		
Carnalite	7,000	2,000	2,000
Kainite 12-15 per cent.	457,000	221,000	231,000
18-22 per cent fertilizer	48,000	91,000	98,000
28-32 " " "	19,000	36,000	53,000
38-42 " " "	265,000	484,000	552,000
Muriate	245,000	188,000	211,000
Potassium sulfate	54,000	66,000	78,000
Sulph. Potash Magnesia	15,000	12,000	16,000

Arrangements are being made by the Board of Directors of the L. & N. Brown Coal Co. (Ltd.) to dispose of their patent rights in the L. & N. (Laing & Nielson) process in Tasmania to the Australian Shale Corporation, on terms that will provide for a controlling interest in the Australian Corporation to be retained by the British Co. The L. & N. Brown Coal Co. is a subsidiary of Sensible Heat Distillation (Ltd.), which is the holder of the various patents connected with the L. & N. process, the English operating company being L. & N. Coal Distillation (Ltd.). The latter company is proceeding with the erection of low-temperature carbonization plants in England, and affiliated companies are acquiring a considerable number of Brown Coal and other properties in various parts of the world.

Exports of photographic chemicals from Germany to the United States increased almost 100 per cent. in quantity in 1927 as against 1926, although the value of shipments was less in 1927 than in the previous year. During 1927, 35,397 pounds of photographic chemicals, valued at $30,840, were shipped from Germany to the United States as compared with 18,297 pounds in 1927, having a value of $31,179.

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German Nitrogen Group Offers New Fertilizers

German nitrogen syndicate offers a new fertilizer for sale, called montansalpeter, which is produced by the Mont-Cenis people, members of the Nitrogen Syndicate. Montansalpeter differs little from the I. G.'s leunasaltpeter, the ammonium sulfate nitrate fertilizer produced at Wolfen Bitterfeld and by Chemische Fabrik Lothringen, at Gerthe in Westphalia. Montansaltpeter is also an ammonium sulfate-nitrate, with 26 per cent. nitrogen, with about one-fourth nitrate nitrogen and three-fourths ammonia nitrogen.

Another New German nitrogen fertilizer, produced by Kohle-Chemie A. G. newly founded, and operating a Casale ammonia synthesis, is the so-called kalk-ammon, or ammonia chalk, prohuced by mixing ammonium chloride and limestone.

Five Nitrophoska combinations of nitrogen, potash, and phosphoric acid concentrates are also on the market now reports Trade Commissioner William T. Daugherty, Berlin.

A new light is shed on the American business barometer through the establishment of index numbers of wholesale prices of fertilizer materials by the Agricultural and Scientific Bureau of the N. V. Potash Export My., according to an announcement by J. N. Harper and G. J. Callister, codirectors of the bureau.

Following his work in the department of agricultural economics and farm management at Cornell University, Ithaca, N. Y., Dr. Edmund E. Vial, statistician of the bureau, has made a complete series of index numbers that are based on fertilizer prices over a period of 31 years.

Realizing the direct relationship that exists between the demand for fertilizers and the prices of crops, Dr. Vial contrasts the fertilizer index numbers with the prices of important crops as well as general commodities each month for the use of buyers of fertilizers material, economist, bankers, financial editors and agricultural workers in economic fields, to whom this information will be made available periodically through Fertilizer Economics.

Official Canadian figures disclose the fact that the United States exports of coal tar dyes to Canada rose, in the 12 months ended March 31, 1928, to 1,640,960 pounds valued at $858,263, from the 1,482,904 pounds valued at $858,263, from the 1,482,094 pounds valued at $885,187, the previous corresponding period.

A reduction has taken place in both volume and value of imports of coal tar dyes into Canada from Great Britain, France and Germany, however. British exports fell from 138,562 pounds valued at $87,056 to 104,909 valued at $75,901, German from 813,968 pounds valued at $588,907 to 799,153 pounds valued at $508,201 and French from 162,371 pounds valued at $38,618 to 33,320 pounds valued at $14,503.

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CHEMICAL WORKS
PHENOLPHTALEIN
Powder Impalpable
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P. B. 2 Bussum
Cable Address: Chemische Bussum

A report on the rubber industry of Canada for the year 1927 issued by the Dominion Bureau of Statistics gives the number of establishments engaged in the industry as 44. with an aggregate capital of $66,266,064, as compared with 39 establishments, with a total capital of $62,661,702, in 1926. The total cost of all raw material used was $44,724,502. Raw rubber was the chief material with a total value of $23,626,111. Gross value of production amounted to $91,413,730, an increase of $4,905,593 or 5.67 per cent. over 1926. Of the three main classes of production, rubber tires accounted for $50,586,942; rubber footwear for $27,628,612; and other rubber goods for $13,198,176.

Merchandise, invoiced as "Whiteoline," consisting of copper sulphocyanide, is entitled to free entry under paragraph 1565, tariff act of 1922, the Customs Court rules in sustaining a protest of Lo Curto & Funk, New York. The collector's assessment at 25 per cent. ad valorem, under paragraph 5, as a chemical compound, is set aside in an opinion by Judge Brown.

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Strips
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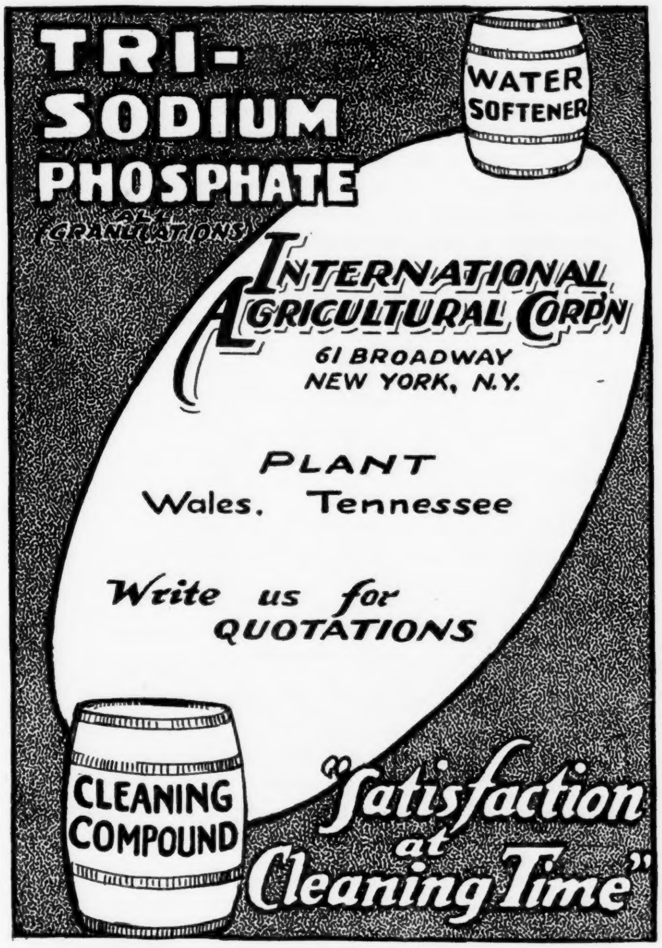

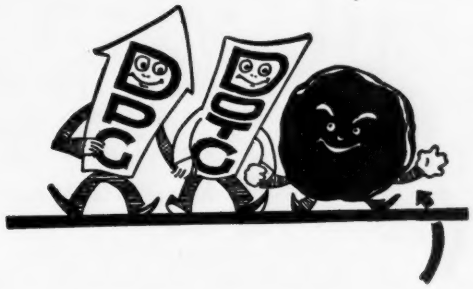

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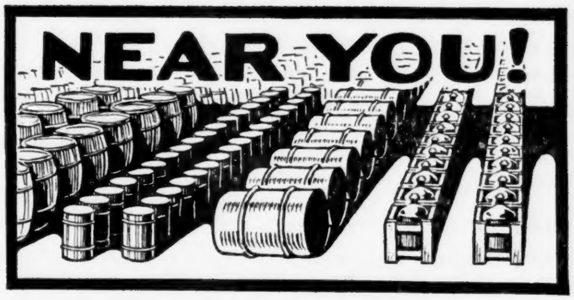

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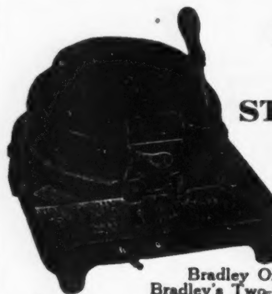

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WANT ADS
in
CHEMICAL MARKETS
BRING
RESULTS

Spain's Iron Oxide Exports Lower

Exports of red oxide of iron ground and crude, dropped from 7,467 metric tons in the first quarter of 1928 to 6,039 tons in the June quarter, although increased shipments were made to both the United States and Germany, reports Consul Austin C. Brady, Malaga. Sales of the ground product to Great Britain were greatly reduced, and of crude ore to France, Belgium and Italy. A comparison of exports for the first two quarters of 1928 and the June quarter of 1927, by the principal countries of destination, is given below:

	1928		*1927*
	June Quarter, Metric tons	*March Quarter, Metric tons*	*June Quarter, Metric tons*
United States...	1,786	1,588	1,528
Germany.......	1,145	1,285	876
Great Britain...	769	1,226	1,368
France.........	601	1,090	705
Belgium........	548	831	1,083
Italy..........	468	765	922
Netherlands....	253	157	169
Other countries.	469	525	419
Total........	6,039	7,467	7,070

Sales of potash by the German Potash Syndicate for the period October to September, inclusive, 1927-28 are 12 per cent. higher than for the corresponding period in 1926-27, reports Trade Commissioner William T. Daugherty, Berlin. The following table shows in metric tons of pure potash the monthly sales of the Potash Syndicate for the October-September periods 1926-27 and 1927-28.

	1926-27	*1927-28*
October..............................	63,090	63,730
November............................	68,370	68,353
December............................	95,730	100,470
January..............................	190,367	202,010
February.............................	182,837	208,400
March...............................	164,920	161,460
April................................	50,950	67,414
May.................................	43,070	63,746
June................................	82,950	99,948
July.................................	88,820	102,608
August..............................	84,550	108,696
September...........................	118,629	140,818
Total...........................	1,234,283	1,387,653

Commissioner of Patents in case of the Oakland Chemical Co. vs. Bookman has held that the notation "Peroxogen" is descriptive of the class of substances to which it was applied, hydrogen peroxide bleaching compounds and bleaching powders, and therefore not capable of exclusive appropriation and registration.

Applicant's contention that the examiner of interferences erred in not allowing it to show that the opposer did not own the trade mark "Dioxogen", to which applicant's mark was alleged to be confusingly similar, was not sustained, on the ground that the statutes merely require an opposer to show that it would probably be damaged by the registration of applicant's mark, and that proof of ownership of the mark is not necessary.

United States imports of synthetic dyes in the 10 months ended October totaled 4,380,181 pounds valued at $3,539,871, according to the Department of Commerce. Corresponding 1927 figures are reported as 3,462,662 pounds worth $2,836,285. October dye receipts totaled 608,852 pounds worth $501,601, a figure greater than that for any of the first 10 months in 1927 and exceeded only by April, 1928.

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Exports of Insecticides and Disinfectants Ahead of 1927

Exports of all insecticides, disinfectants, deodorants, etc., from the United States during the first nine months of 1928 increased 30 per cent. in quantity and 15 per cent. in value over the corresponding period of 1927. In fact the figures for the first three quarters of 1928 compare very favorably with totals for the entire year 1927 when 21,676,271 pounds valued at $4,788,735 were exported.

United States exports of insecticides and disinfectants according to classes for the first nine months of 1928 are as follows:

Kind	*Pounds*	*Value*
Nicotine sulphate	86,699	$84,214
Other tobacco extracts	1,951,245	448,621
Lead arsenate	1,022,085	130,361
Calcium arsenate	949,165	55,855
Other agricultural insecticides, fungicides, etc	5,067,134	498,149
Household insecticides, disinfectants, deodorants, etc	13,547,449	3,305,473
	22,623,777	4,522,672

During the year ending March, 1928, Canada's shipments of acetic acid were valued at a third more than for the same period of 1926-27. According to official figures, the United States purchases about one-fourth of the total export value.

Exports of Acetic Acid from Canada for Twelve Months Ending March

	1927		*1928*	
Destination	*Cwt.*	*Value*	*Cwt.*	*Value*
United Kingdom	154,836	$1,755,890	187,847	$2,234,853
United States	86,118	564,551	109,448	837,713
Mexico	2,226	27,176	3,367	40,843
Other Countries	1,836	17,604	1,938	23,796
Total	245,016	$2,365,221	302,600	$3,137,205

Lactic acid imported into the United States for consumption during August, 1928, amounted to over 50,000 pounds. Of this amount 4,074 pounds contained from 30 per cent. to 55 per cent. of lactic acid by weight and was valued at $354,000, while 49,526 pounds, value $16,116, contained 55 per cent. or more by weight of lactic acid. The invoice price of the 30 per cent.—55 per cent. product was 8.7 cents in August as compared with 6.5 cents in January, 1928.

The United States only furnishes Japan with about five per cent. of its total imports of ammonium chloride. Japanese imports during 1927 amounted to 5,488,000 pounds and during the first six months of 1928 to 3,300,000. Germany furnished about 58 per cent. and England about 30 per cent.

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Sales Agents For
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"WYANDOTTE" PRODUCTS

LOS ANGELES

Business conditions remain good for November on the Pacific Coast. Prices on acids and alkalies remain approximately the same for 1929. There is a shortage reported and higher prices looked for on acetic acid and an advance on potassium permanganate due to increased duty. Nineteen twenty-nine contracts are being actively sought. Chlorine has dropped considerably in price due to new competition looked for on the Pacific Coast.

CHICAGO

General business conditions in the Chicago and Great Lakes territory at the time of this report are good. Due partially to this condition, the chemical business in the territory has been steadily improving. Stearic acid, red oil and the general line of heavy chemicals have been the most active during the early part of the contract season. The month of November has witnessed advances in the price of stearic acid and red oil.

BOSTON

A very much better feeling is noted among the buyers throughout New England. Even with the advanced prices on many commodities, buyers are promptly covering their 1929 requirements by contract. Buyers generally seem to anticipate paying higher prices for their next year's contracts. Denatured alcohol is very firm, with a very active market, while wood alcohol still remains scarce and high. The glaubers salts market has advanced approximately 25c per hundred pounds. Collections have improved. The outlook for the coming year in business is very much better.

KANSAS CITY

Business is maintaining itself in the middle Western territory in excellent shape; inquiry is good and markets unusually active for this time of year. Collections are improving and there is a spirit of optimism prevading this territory.

Blue vitriol remains firm and strong. Due to unfavorable weather, the demand for alcohol is not quite so active although the market remains firm with some small resalers cutting the price appearing now and then. Methanol is in short supply and deliveries are somewhat delayed. The paint industry has slowed up in its demand as it would be expected. Cattle are high and the condition of the farm industry is rapidly improving in this territory.

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ST. LOUIS

Generally speaking, business during the month of November was not quite so good as the previous month. This was due in large part to the fact that large purchasers are preparing for inventories and are deferring purchases wherever possible until after the turn of the year. Alkali contracts were eagerly sought, prices remaining the same as they had been during the past few months. On contracts covering 1929, anhydrous ammonia showed an increase of ½c per pound. During the month stearic acid remained strong and oleic acid advanced ½c per pound. Reacting to the firm tin market, the price of tin oxide advanced 2c per pound the latter part of the month. The weather continuing unseasonably warm, the demand for anti-freeze materials is not as great as was expected, altho there was a two day rush for alcohol, ethylene glycol, and glycerine.

CLEVELAND

Conditions in the Cleveland market as far as the paint manufacturers are concerned show a slight tendency to slow up due, however, only to the fact that this is the season when the automobile business is slacking up somewhat and that the building and contracting painter trade are very dull. The steel industry showed a tendency for about one week of slowing up but again is going full speed and probably running about 90% capacity. Due to the strength in molasses, the alcohol market is very firm and glycerine is likewise firm. A great many of the concerns show a tendency to book contracts for next year on raw materials. Generally speaking, everything is running along in good shape and most of the industries in the Cleveland territory are very optimistic about next year.

PHILADELPHIA

General business conditions for the past month have been very good. Considerable contracts have been placed for delivery over next year and consumers are now taking fairly regular deliveries on their contracts for 1928. All told, we would say the conditions are very favorable and we look for better business during 1929. Paint and varnish industries seem to be busy while within this last week there has been some slowing up in the woolen trade, never-the-less the industry we believe is going on at a more satisfactory basis than it has.

There is active inquiry for such items as copper sulfate, naphthalene, chlorate of soda, castor oil, glycerine, denatured alcohol, and solvents of all descriptions.

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WANTS & OFFERS

Rates—All classifications, $1.00 an insertion for 20 words or less, additional words 5c each per issue: 10c for forwarding mail if box number address is used.

[Payment must accompany order—we cannot bill want ads.]

Address: Wants & Offers, Chemical Markets, 25 Spruce St., New York

Business Opportunities

PARTNER with at least $5,000 to produce synthetics. Have plant for production and company to take output. Box 812 CHEMICAL MARKETS.

A Chemical Manufacturing Company, with operating plant and ample capital, wishing to diversify and expand, will give consideration to the purchase of patented processes for improving existing methods or for making new chemicals for which a market exists or can be created, even though not now manufactured by us. Box 786 CHEMICAL MARKETS.

CHEMICAL MANUFACTURERS—We wish to represent a reliable manufacturer of chemicals for distribution in St. Louis, Missouri and vicinity. Have a live, aggressive sales force and large warehouse centrally located. Through other lines we now handle, are constantly in touch with industrial concerns using chemicals. Also have similar organization in Chicago. Can handle account for either or both localities. Box 820 CHEMICAL MARKETS.

BUSINESS OPPORTUNITIES—French leading firm well introduced through consuming circles; rubber, paint, ink, blacking industries, etc., wants the agency of an important Carbon Black Manufacturer. Will submit best commercial and bank references in the States and in Europe. Box 821 CHEMICAL MARKETS.

WANTED—Raw material specialty used by Paint manufacturers. To augment present line we will buy controlling interest or outright, a good specialty (raw material) used by paint manufacturers. Write fully concerning product, market possibilities, manufacturing cost, profit margin and all details which will facilitate preliminary negotiations. Box 818 CHEMICAL MARKETS.

For Sale or Rent

FOR SALE—Voland & Son Balance Scales. Scales are new—priced right. H. S. Newcomer & Son, Mt. Joy, Pa.

Warehouse Space For Rent

Downtown New York Drug & Chemical firm will rent 1-2 floors in their warehouse with service—electric elevator. Out of town manufacturers desirous of carrying stocks in lower New York should be interested. Box 801, Chemical Markets

FOR SALE—Galvanized iron building approximately 160′ x 60′ located on railroad siding and frame office building 20′ x 20′. Buildings on property leased from Lehigh Valley Railroad Company, Newark, N. J. Suitable for warehousing or manufacturing purposes. Telephone Longacre 2891 (New York).

Help Wanted

THE GREENDALE COMPANY, Lawrenceburg, Indiana, distillers of the finest grain alcohol in this country, has openings in all large cities for sales representatives to call on druggists, doctors, hospitals and institutions. Earning capacity limited only by applicants energy. Permanent connection with unusual possibilities. Apply by letter stating all details as to experience.

SALESMEN: College graduates preferably in chemistry with general knowledge of raw materials used in the process industries to call on executives in these fields with a thoroughly established proposition. Write fully age, education and experience. All replies treated in confidence. Address Box 807 CHEMICAL MARKETS.

Situation Wanted

WANTED—Position as chemist, teacher or librarian in Boston or north of Boston by girl chemist, holding B.A. from Holyoke and M.S. from M. I. T., and with seven and one-half years' industrial experience. Box 813 CHEMICAL MARKETS.

EXECUTIVE CHEMIST, Ph.D., organic, 16 years varied industrial research, development, production and business experience, seeks permanent responsible engagement requiring special qualifications for executive ability and high technical proficiency combined with capacity for understanding of, and adaption to, commercial ends involved. Box 811 CHEMICAL MARKETS.

BY AN EXPERT in the manufacturing of flavoring extracts, syrups, bottlers, soda fountain, bakers and confectioners' supplies. Many years' experience with well-known American and European houses. Can manage factory and help create sales. Willing to start with moderate salary. Box 815 CHEMICAL MARKETS.

CHEMIST, colored, 15 years experience, designer of processes, desires employment as laboratory helper. Box 817 CHEMICAL MARKETS.

SALESMAN, graduate chemist, two years laboratory and foundry experience, six years heavy machinery sales experience, seeks change. Box 816 CHEMICAL MARKETS.

Filter Paper Trade

Experienced expert in the filter paper trade, especially Ashless Filters, would sell his experience to a likely firm in that line. Offers to be sent to E. Kuhn, Duren Rhld., Virtelstrasse 21 I, Germany.

SALES ASSISTANT; Export or domestic, young man, American, college graduate, knowledge of advertising: thoroughly experienced in sales, distribution, credits, collections, Spanish etc. Unusual experience and executive ability. Available immediately Box 819, CHEMICAL MARKETS.

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We purchase any quantity of surplus and discontinued stocks of—Chemicals, Oils, Waxes, Gums, Drugs, Coal Tar Products, Intermediates, Colors and Allied Products. Also By-Products and Residues. Box 775 Chemical Markets.

Raw Materials

FILTER-CEL.—Wanted to purchase. Send sample and quote price. International Products Corp., Trenton, N. J.

MID WEST maker of large quantities of high-grade by-product hydrogen seeks outlet other than ammonia, and has ample room and facilities for plant for utilisation of hydrogen. Output can be purchased, or will consider practical plan for use on spot. If a practical plan is accepted, the person making it will be offered position in charge of the hydrogen utilisation plant. Reserve right to reject any and all offers and plans of whatever nature. Box 800, CHEMICAL MARKETS.

GLYCERINE DISTILLED always offered advantageously to direct consumers. Box H.Z. 9035 Rudolph Moose, New York City, Graybar Building 2626.

TALLOW—Wanted to buy for soap manufacturing purposes tallow and grease; send samples and best quotations, f.a.s. American ports. Semach & Co., Genoa, Italy.

Equipment

FOR SALE: Devine Vacuum Dryer 5′ x 25′, with Condenser and Vacuum pulp. Box, 806 CHEMICAL MARKETS.

WANTED—CHEMICAL MARKETS, Vol. 19, No. 4, 8, 10, 12, 16, 18, 20, 22, 24, 26, 28, 30, 32, 1926 issues. Library of Congress, Washington, D. C.

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"WE"—*Editorially Speaking*

There is a tie for first place among the best chemical stories of the month. Both, most appropriately at this season, have to do with contracts. Each is a sort of inversion of the other. One comes from "over on the Jersey side": the other from the Middle West.

A small buyer of ten drums weekly on contract had been the target for some highly competitive price quotations, and he fell into the habit of gleefully calling his contract supplier on the telephone. He was rather nasty in his accusations of robbery and indicated that another year his valued business would be placed with someone who would give him the "best price" in the first instance. Three times in a row this exchange of pleasantries became more and more accrimous, and each time the seller protected the buyer against declines which he knew very well were nothing but rip-saw competition.

A fourth time the telephone rang.

"Say," growled the buyer, "just what kind of a sucker do you think I am ?"....

"I'll bite. What kind of a sucker are you ?"

"Not the kind you seem to think. Didn't you tell me that 42c was positively the bottom ?" Well, I've just gotter price of 40c delivered for the balance of the year. What y'gotter say to that, you big burglar ?"

No reply.

"Well, what y'gonner do about it ?"

"Here's what I'll do. I sell you for the balance of the year at 10c a gallon."

"Delivered ?"

"Yes, delivered. Delivered with the drums wrapped in tissue paper and tied with holly and red ribbons."

"Oh, that's all right by me."

"It is, eh ? Well, didn't you forget something ?"

"N-o-o ?"

"What about the coupons and an extra package of matches."

Quite a different sales executive, selling a different chemical, called on one of his competitor's best customers last month, with quite different results.

"I don't know how familiar you are with the market situation," he said, "but you know there's been a price reduction. It's going to save you so many thousand dollars during 1929, and you ought to take into consideration that my company is responsible for this lower price. The old companies were all set to hold the price at the old level; but we forced them to come down, because its' our policy to pass on to the consumer any savings we make in improved methods."

"You damned snake!" exclaimed the purchaser. "You haven't got any improved process. Your costs are probably higher than the old companies. You are cutting your way into an adequately supplied market. And you have the effrontery to come here and weep all over the place about your service to the poor consumer. I've got some competitors of just your mean and mangey sort. I'll give you such special consideration that you won't get our business—not if all your competitors burn up, or blow up, or go into bankruptcy."

The sale of chemicals to the rayon industry has increased by leaps and bounds over the past five years. Based on figures which have been culled authoritatively, we are able to present some idea of how this increase will again set a new high from a point of view of tonnage moved during the year to come. The market position of caustic soda, sulfuric acid, carbon disulfide—to mention but a few of the chemicals which have been lent a tremendous impetus during the past few years by the seemingly inexhaustable demands of this infant industry — has been greatly enhanced. Further building programs in the rayon industry—also discussed in "Benefits to the Chemical Industry from the Use of Rayon"—gives assurance that this volume of business may be expected to increase further with each passing year of the next decade. The chemical industry has reasons to be grateful to rayon and lacquers—those two offsprings of its own laboratories.

Bringing to a conclusion his story on the chemical industry during and since the World War, Alan A. Claflin again relates, in a manner which makes distinctly interesting reading, of the conception and development of many chemical products, which, at the time of their discovery were considered war measures, but later blossomed forth to form one of the most important groups of the post war chemical industry.

A. Cressy Morrison gave a very interesting talk at a recent meeting of the American Chemical Salesmen's Association Meeting. Only lack of space forces us to extract some of the more important points of this talk by one of the spokesmen of the industry. As may be gathered from that material which we have used in this issue, Mr. Morrison traces the history of the chemical industry from the beginning of all time through its stages of development, down to the present day with its efficient methods, mass production and efficient laboratories. He puts it up to the salesmen of the present day to carry on the good work in a manner which will never bear reproach.

Always a splendid talker, Mr. Morrison drives home his points with great effectiveness and it is these high spots that we print for the industry's perusal.

The recent Second Annual Conference on Bituminous Coal at the Carnegie Institute of Technology was the occasion for the gathering of scores of the world's most famous scientists. From the mass of papers which were delivered, some few stood out as being most constructive. Among these the paper of Dr. Franz Fischer of Germany was adjudged "very good" by competent authorities.

Admittedly a bit technical for the readers of CHEMICAL MARKETS, this paper is presented to afford an opportunity for insight into the tremendous amount of work which is being done in Europe on coal chemistry.

No one is better able to discuss the relation between the Department of Labor and the chemical plant than Dr. Graham-Rogers of the New York State Department of Labor. Dr. Graham-Rogers gives some interesting data on the functions of the various divisions which go to make up the Department. While it is true that he speaks only for the New York State Department, what he has to say on the subject should be of material interest to plant managers throughout the industry in all sections of the country.

In the short span of three decades the world has transformed from the position of fearing ultimate starvation because of lack of nitrates to that point where if nitrogen production is not curtailed, an oversupply of food stuffs is considered an imminent potentiality in some quarters. This is one of many and historical points brought out by Dr. Firman E. Bear of Ohio State University in his address before the Southern meeting of the National Fertilizer Association.